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PROTECTIVE INOCULATION FOR SYMPTOMATIC ANTHRAX (BLACK QUARTER).

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IN their classical work, MM. Arloing, Cornevin, and Thomas, the originators of inoculation against symptomatic anthrax, indicate the extremity of the tail as the most favourable part on which to perform the operation. But the density of the connective tissue, as well as the low temperature of this region, are unfavourable circumstances for the development of this disease; and, in fact, notwithstanding the thousands of protective inoculations effected on this organ, there has not yet been developed a single case of artificial anthrax, and spontaneous anthrax has been also absent.

But if inoculation at the tail has never developed the anthrax tumour, it may produce the disease in some other region, although this is rare, and the anthrax may present itself at the haunches, croup, shoulder, or sides of the body. Of 158,579 inoculations of which I am cognisant, there were 107 cases of symptomatic anthrax by inoculation, the greater proportion occurring in the Canton of Bern; this is 0·67 per cent.

Other troublesome consequences due to caudal inoculation have been observed. In animals which have been inoculated in this way, there have been observed violent erysipelatous inflammations, suppuration and necrosis, as well as rapid mortification of a large portion or even the whole of the tail. There have also been noticed caries and necrosis of the coccygeal vertebræ complicated with falling off of the tail, and in some animals—though happily rare—tetanus. In

some animals the inflammation has extended to the croup, and has occasionally produced paralysis or caused death. Considering the great number of inoculations made up to the present time, the resulting accidents have been very few, though nevertheless they have been too many.

These accidents are, in my opinion, due to the following causes, excluding, of course, inoculations badly carried out, or the employment of fluid which has been prepared too long a time: 1. Prolonged retention of the solid portion of the vaccine in the subcutaneous connective tissue of the part; 2. Frequent uncleanliness of the tail or of the cowshed; 3. Admission of foul substances into the inoculating cannula.

In our country and at high altitudes, where there is no straw for litter while the animals are depastured, the tail is very dirty and is not in a favourable condition for the operation. Besides this, some animals have the skin so closely adherent to the caudal vertebræ, that there is often the greatest difficulty experienced in introducing the cannula between it and the bones.

Another disagreeable, though not very important circumstance, is the frequent hæmorrhage that results from the puncture.

These circumstances, combined with others not less troublesome, occurring for several days during the vaccination season, have made me desirous of trying another region for the inoculations.

Arloing, Cornevin, and Thomas state that inoculations may be practised on the ear; this I have done with twenty-four animals dnring the last spring. But this method did not please me. If a fine cannula is used, in order to avoid obstructing it, the inoculating fluid should be perfectly filtered, and this excessive filtration deprives it of its principal agents; while if the cannula be large, it is scarcely possible to introduce it between the skin and the concha without incurring the riskof piercing either of these with the cannula, as the animal often moves either its head or ears. Besides, in consequence of the intimate union between the skin and conchal cartilage, a portion of the injected fluid flows back.

Inoculation of the ear has these advantages over that of the tail: cleanliness is assured, the operation is more expeditious, and local accidents are avoided.

Arloing, Cornevin, and Thomas admit that, in principle, inoculation against symptomatic anthrax may be made in any part of the body. But until the present time the region of

the shoulder was considered dangerous, because of its abundant and loose connective tissue, which readily allows of the formation of a violent local tumour.

Professor Kitt, of Munich, has attempted inoculation into the shoulder of several cattle, behind the extensors of the fore-arm, with an energetic vaccine prepared by himself (equal in activity to the vaccine of Arloing and Cornevin), and these essays have never been attended by the slightest accident. In view of this favourable result, Suchanka, Palla, and Schwaiger, in the Duchy of Salzbourg, in 1888, inoculated forty-three heifers with the second vaccine from Lyons; in 1889, they inoculated thirty-three animals in the shoulder; and in 1890, 1,176, one of which died four days afterwards of artificial anthrax. They employed Kitt's vaccine, prepared in a current of steam. In 1891, 1,254 cattle were inoculated in the same country without any accident. Of 2,506 inoculations with strong vaccine on the side of the thorax, only one fatal accident from inoculated symptomatic anthrax was reported. This result should be considered very favourable, especially as the 2,505 animals were spared an attack of the disease in consequence, although they had been inoculated only once.

In presence of these encouraging results, and also in consequence of correspondence with Professor Arloing, in the spring of this year I commenced inoculation in the region of the shoulder and almost exclusively in front of it. For this operation M. Walter Biondetti, of Bale, made me a pointed cannula adapted to my syringe, and having the calibre of the small obtuse cannula of Arloing, Cornevin and Thomas. With such a calibre it is not necessary to filter the solution, and up to now I have only used unfiltered fluid.

I have twice practised inoculation in the shoulder of 530 young bovines, 119 with the first vaccine, 198 with the second and 213 the first time with the first, the second time with Arloing and Cornevin's second vaccine. The total number of shoulder inoculations was therefore 743. I have also inoculated 729 animals in front of the left shoulder joint, eight behind the elbow of the same side, and six by subcutaneous injection on the left scapular surface.

By this method I have already inoculated 370 animals without any accident, except that in some there was developed an œdematous tumour of no importance at the seat of inoculation, and in very rare instances, eight days after the second inoculation, a small tubercle about the size of a pea was noticed where the puncture had been made.

Having obtained these brilliant results, I gained confidence and security in the method. But Schiller has remarked "the dark powers of destiny control us sooner or later"; and I was not long before I was deceived. An inoculated animal, 20 months old, became unwell 27 hours after the second inoculation—made in front of the shoulder; the first time it had been inoculated at the tail. It was affected with symptomatic anthrax, and died in about 36 or 37 hours. The tumour rapidly attained enormous dimensions; in 24 hours after its appearance it extended over the entire shoulder, the left side of the neck and the withers. But I am convinced that the animal might have been saved if the tumour had been scarified immediately after it appeared, and the wound disinfected and covered with carbolised bandages; as 24 hours after the disease was first noticed the animal still had an appetite, which is never observed in spontaneous symptomatic anthrax.

What in this case was the cause that favoured the development of inoculated symptomatic anthrax? I confess I cannot give an answer, for among the 112 animals which I had inoculated on the same day with the second vaccine, there was not the slightest accident. It may be remarked that this animal was so very restless during the operation that I was twice compelled to pass the cannula through the skin; and it was in all likelihood of a very excitable nature, and had not much power of resistance constitutionally; it might even be suspected that it had already been attacked by the malady when it was inoculated.

A heifer, aged 20 months, belonging to another owner, and which had been inoculated in front of the scapulo-humeral articulation, was seized with illness 30 hours after the second inoculation, and because of this it was killed. There was only slight tumefaction in the inoculated region and at the masseters. This animal had already caused me some trouble, as in the preceding year it was the only one which had an accident of 113 cattle which I had inoculated at the extremity of the tail, in the communes of Ependes and Arconciel; it then had an inflammation extending nearly the entire length of the tail; this ran on to mortification, and one-half of the organ was lost. We thought it must be well protected from symptomatic anthrax, and now in the following year inoculation gave it fatal anthrax. This animal seemed to have had a particular predisposition, or a weakness in presence of the attenuated virus of anthrax. However this may be, the following circumstance should be related. As I did not wish

to operate on the tail because of the close adherence of the skin, I inoculated the ear; this was not very successful, in consequence of the unsteadiness and great sensitiveness of the heifer. I therefore had to puncture and syringe twice, and on each occasion a portion of the injected fluid made its escape outwards; as the quantity injected appeared to me to be insufficient because of this loss, I injected a half dose in front of the shoulder. Had the animal received too much vaccine? I cannot say. The first inoculation which had been practised on the shoulder eight days before had done no harm.

These two accidents with inoculated anthrax did not discourage me, and I have continued to inoculate in the region of the shoulder. Since then I have made 255 similar inoculations without any disagreeable result; but I have slightly modified my method. Up to the time of these accidents, and during the time I inoculated at the tail, I employed non-filtered vaccine, and I imagine that this non-filtration, combined with the sensitiveness and the feeble reaction in the animal, had contributed to their occurrence. In reflecting on the cause of these cases of inoculated anthrax, I suspected the non-filtration. In fact, there was reason to believe that the prolonged presence of the more gross particles of the vaccinating fluid in the rich and loose tissue of a region that had a more elevated temperature than the end of the tail, might be the cause of this inoculated disease in very sensitive and weakly animals. So, from that time, I have used a slightly-filtered fluid.

The instruments employed, as well as the porcelain, are disinfected with a solution of carbolic acid every time they are used. The fluid for inoculation, which is obtained by the careful dilution of the vaccinating powder, is filtered through a thin and clean piece of cloth; and, in order to facilitate the passage of the fluid through it, the cloth is steeped before filtration in distilled water, while the fluid itself is so pressed upon, that only the crudest portion of it remains. We know that the filtration may be imperfect without the fluid losing a notable quantity of its protective property; while the slightly filtered material is so rapidly absorbed, that the development of symptomatic anthrax by inoculation at the part operated upon, is averted. Suchanka, Pulla and Schwinger, although they did not resort to filtration, have only had one case of artificial anthrax in 2,506 simple inoculations on the left side of the chest.

The above had been written some time when I learned the

following results of inoculations made on the left side of the chest.

I.—According to Zimmermann, there were inoculated in 1891, 3,666 animals in the Voralberg, and it appears that eight of them—or 0·25 per cent.—died afterwards of symptomatic anthrax. There was not a case of inoculated symptomatic anthrax. In the spring of 1892, 4,820 animals were inoculated in the same district, but, at the moment I write, I am not aware of the result.

II.—In the department of Meurthe-et-Moselle, France, MM. Guillod, at Etain, and Simon, at Spincourt (*Recueil de Médecine Vétérinaire*), inoculated in the spring 1,500 heifers in the thorax without any accident, and only one of them died at a later period of symptomatic anthrax.

I have come to the conclusion that, notwithstanding the two cases of Anthrax developed from my inoculations, I shall continue to inoculate, without fear, in the region of the shoulder, with a slightly filtered emulsion, and I have reason to believe that my colleagues in Fribourg will adopt my method. The advantages of it, over inoculation at the tail, are considerable, and I need only cite the principal. The operation is very simple and very rapid, whether performed before, behind, or on the shoulder; in an hour from forty to forty-five animals can be inoculated. It is not necessary to cut the hair at the part to be inoculated, nor yet to disinfect it, a clean part being chosen, or it may be brushed. The skin is softer and much less adherent than at the coccyx. The trocar is not needed. As soon as the syringe and cannula are withdrawn, the wound closes immediately and in a manner completely, so that dirt cannot penetrate. Reflux of the injected fluid never occurs, and the ligature recommended for inoculation at the tail can be dispensed with. There is never that amount of hæmorrhage which is so frequent when the tail is operated upon, and which more or less deranges the operation. All those accidents which are more or less troublesome with the tail are avoided. Finally, with regard to cleanliness, inoculation at the shoulder or chest is much to be preferred to that at the tail.

So far as figures are concerned, up to the present time I am cognisant of 13,022 inoculations at the shoulder, only five of which had a troublesome result, only 0·38 per cent., while by the other method the loss is nearly double this amount.

I believe also that inoculation at the shoulder is more protective than that at the tail, because of its cleanliness, the higher temperature of the part, and more especially because

of the more rapid absorption of the vaccine in this region. By this method 8,241 animals of which the history is known, have been inoculated, and of these only ten have been attacked by symptomatic anthrax—or 0·12 per cent., while by the other the percentage of loss is more than treble. It should be remarked that of these 8,241 animals, 6,001 had been submitted to only an inoculation with an energetic vaccine.

Of 2,241 animals inoculated with the Lyons vaccine, only one has died from spontaneous symptomatic anthrax, or 0·44 per cent.

These are truly splendid results.

The technic of inoculation.—To prevent the point of the cannula being blunted, the emulsion is aspirated into the syringe without that portion, which is screwed on afterwards. When the inoculation is made before or behind or on the shoulder, a fold of skin is taken up and the cannula is quickly pushed into the base of the fold and through into the subcutaneous connective tissue; care must be taken that the instrument does not pass through the entire fold of skin or penetrate the muscular tissue. If these accidents happen the injection will not be properly made; so to remedy them the fold of skin should be let go and the syringe slightly withdrawn, when the injection can be completed.

As I have already stated, I have made all my inoculations according to this method and a little below the shoulder articulation; but the operation is as easily performed on the side of the chest, almost immediately behind the extensors. The farmers much prefer this method to inoculation at the tail, as being less tedious and difficult.

I inoculated 991 animals last spring, and only one of these was attacked with symptomatic anthrax during the summer grazing on the Alps—0·10 per cent.—and this bovine had been inoculated at the ear. Inoculation at this part is much less protective than at the shoulder, while it is frequently very difficult and incomplete. The other animals—528 of which were inoculated at the shoulder and 439 at the tail—returned in the autumn safe and sound.

Ought one or two inoculations to be made? Arloing and Cornevin, to whom I put this interrogation, replied: "The great question is to know whether we should renounce the two inoculations and employ only one vaccine, administered at one inoculation. Up to the present we have persisted in making two inoculations; but we find this alternative: increase the activity of the vaccine and so incur the risk of

killing a greater number of animals, or employ a vaccine which will not kill and which will protect less. It may happen that under the influence of unknown causes an animal will profit little from one inoculation, and that there will be more likelihood of the object being attained in again bringing it into contact with the vaccine. The maximum of protective action can only be obtained by repeated inoculation."

Kitt, in two very friendly letters of July 5th, 1891, and the 26th of last April, informs me, among other matters, that he is always telling the veterinary practitioners to whom he sends his vaccine, that the double method of inoculation carried out at Lyons acts more surely than his own, which consists in making a single inoculation with an energetic vaccine.

Notwithstanding this statement, the success obtained, and the greater rapidity and convenience of this method, justify the single inoculations. But it is evident that the vaccine should reach competent hands, and this the Lyons preparers of the vaccine cannot be certain of.

Of 6,172 single inoculatjons, the results of which are known, nine of the animals died of symptomatic anthrax—or 0·145 per cent. This was in Austria. But among 2,028 animals inoculated twice at the shoulder or thorax, in France and in the Canton of Fribourg, only one was attacked with symptomatic anthrax– or 0·05 per cent.

Ulterior experience and statistics will enlighten us as to the advantages of one or other of the methods.

SKIN GRAFTING BY THIERSCH'S METHOD.

BY VETERINARY-CAPTAIN J. A. NUNN, D.S.O., F.R.C.V.S., PRINCIPAL, LAHORE VETERINARY COLLEGE.

THIS method of skin grafting differs from the ordinary one, inasmuch that large slips or shavings of skin, and not small islets, are employed; and so far as I am aware it has not yet been introduced into veterinary practice. The procedure is as follows: The ulcerated surface is washed with a 1 in 1,000 solution of bichloride of mercury, and the surrounding hair carefully shaved off to a distance of two or three inches from the border of the sore, the part being covered for six or eight hours before the operation with a sterilized bandage which is kept wet with a 1 in 2,000 solution of bichloride of mercury. This bandage is kept on until the animal is secured for the

operation, when it is removed and the whole surface is thoroughly washed with a 6 in 1,000 solution of common salt, and sterilized in boiled and filtered water.

The part from which the grafts are to be taken is treated in a like manner, being first carefully shaved and washed with soap and warm water. In most cases it is advisable to cast the animal, but it is not necessary to administer chloroform. When the patient is secured, the operation is greatly facilitated if an Esmarch's bandage is applied on the cardiac side of the ulcer, which, if it is situated on a limb, is easily done; should the ulcer, however, be on a portion of the body where the bandage cannot be applied, then hæmorrhage must be controlled by other means.

When the animal has been secured, the bandages which have been kept wet with the 1 in 2,000 solution of bichloride of mercury, are removed from both the ulcer and the surface from which the grafts are to be taken, and, as before mentioned, both are to be at once washed with the sterilized salt solution. The most convenient method of carrying this out is with the ordinary irrigation apparatus, of which there should be two, each under the control of an assistant, one for the ulcer and another for the place from which the graft is to be excised; the latter apparatus for this stage in the operation should be kept constantly playing on the skin, until the termination of the operation.

When the ulcer has been thoroughly washed with the salt solution, the superficial layer of granulations and ring of cicatricial tissue round the edges must be removed to prevent contraction.

Thiersch states that this is essential to the success of the operation, and he uses a curette; but in veterinary practice a sharp scalpel does just as well, if not better.

An incision is made nearly through the true skin around the circumference of the ulcer, just outside the thickened border, and with the scalpel the whole of the area included is carefully and cleanly shaved off level with the surrounding skin, and the stream of salt solution at once turned on.

At this stage the control of the hæmorrhage is most important, as the grafts cannot be placed in position until it entirely ceases; and for this reason, if it can be possibly applied, an Esmarch's bandage should be resorted to, as the operation is then practically a bloodless one. If the bandage cannot be applied, then a sterilized gauze compress must be used, or what I have found act well in any capillary hæmorrhage, a stream of warm salt solution, as hot as can be tolerated,

played over the part; but on no account must the grafts be applied until all bleeding has ceased.

The grafts consist of strips of skin shaved off parallel to the surface by means of an ordinary razor, which must have a very keen edge. Thiersch states that he has used grafts five inches in length and an inch wide; but about two inches long by a quarter of an inch in width is the largest I have attempted.

The thickness of the graft is not important, so long as care is taken that the dermis is not cut through and there is no fat or connective tissue on the lower surface. The best situation I have found to take the grafts from is on the outside of the fore-arm, the muscles being firm and tense. The method by which the grafts are removed is by wetting the razor with the salt solution and then drawing it towards the operator with a slightly sawing movement, when the strip of skin will pile up in folds on its edge. A few drops of salt solution are then placed on the graft, and the razor carrying it is at once brought to the edge of the ulcer. One end of the graft is fixed with a probe, and the razor being drawn forward, the piled up graft unfolds itself and is spread out on the raw surface.

The edge of the graft should be parallel to the cut edge of the ulcer, and ought to very slightly overlap it, in which position it can be readily placed with two probes.

In this manner one graft after another can be applied until the whole surface is covered up, care being taken that there are no wrinkles or folds left in them, but that each piece is flat and straight. If a number of grafts have to be fixed, then it may be necessary to sprinkle a little of the salt solution on those first applied, so as to keep them moist.

During the whole time the grafts are being cut, the stream of salt solution must be kept playing on the part they are removed from. When the grafts have been properly adjusted, the dressing is to be applied, and I have found that the best plan is to place a piece of oiled silk, pierced with holes made with the point of a pair of scissors, directly over the grafts, and on this is laid either absorbent cotton wool or gauze dusted over with iodoform—the whole being kept in place by means of a roller bandage fixed moderately tight.

The oiled silk can be sterilized by leaving it all night in a 20 per cent. solution of carbolic acid; by this arrangement any slight discharge is absorbed without danger of the dressings adhering and displacing the grafts, as the oiled silk presents a smooth surface.

The dressing should not be disturbed for five days or a week, when, if all has gone well, the grafts will have taken and be adherent.

The site from which the grafts have been removed merely requires to be dusted over with iodoform and a bandage applied, when the skin will heal up of itself without any mark or disfigurement.

This method of skin grafting has lately been tried, and with success, in two cases in the Lahore Veterinary College Hospital. In both of these cases there were large ulcers and loss of tissue; and in each of them, although it was in the middle of the hot weather, the grafts were firmly adherent when the first dressings were removed on the fifth day.

Although the details of this method of skin grafting take a long time to describe, in reality the actual operation is a matter of only a few minutes, provided everything is ready and at hand, and, of course, strict antiseptic precautions as to dressings, instruments, the operator's hands, etc., must be observed.

Articles on this subject will be found in the *New York Medical Journal* for October 18th, 1890, and in the "Medical Annual" for 1892 (page 450).

ANÆSTHETICS IN VETERINARY SURGERY.*

BY E. WALLIS HOARE, F.R.C.V.S., CORK.

(Continued from page 89.)

In many instances respiration ceases almost without any preliminary warning, and in some cases death occurs with such rapidity that it would appear as if syncope was the cause.

We must, however, after careful observation of the phenomena induced by the toxic action of chloroform, come to the conclusion that in the majority of cases it is the respiratory centre which first fails. And we are strengthened in this belief by the fact that many cases occur where, to all appearances, life would seem to be extinct, when by the timely employment of artificial respiration the patient can be saved.

We have, too, the fact of the great amount of struggling and the degree of excitement induced in many dogs, to consider that the mechanical means by which the patient is held or secured has a great deal to do with the production of asphyxia.

* Read at the Meeting of the National Veterinary Association, held at Manchester on July 27th.

In the horse when cast there is comparatively little to interfere with the respiratory movements, and anæsthesia is quickly produced with, as a rule, little primary excitement.

The bulk of evidence goes to show that, generally speaking, ether is a far safer agent to use for the production of anæsthesia in the dog, except when from some special reason its use might be contra-indicated.

In considering the actions and uses of the other general anæsthetic, ether, we find that it has also its advantages and its disadvantages.

It has been termed, and very justly so, the sister anæsthetic of chloroform, as its physiological actions resemble very much those of the latter drug.

Both stimulate the higher nervous centres first, and then depress them before acting on the cord and vital centres.

But there are important differences to be noted with reference to the duration and intensity of the periods of stimulation and depression.

Ether is much slower in its action and causes far greater preliminary excitement.

The pulse is quickened and increased in force, and in the second stage the heart and vessels are less depressed, the respiratory centre also less depressed, the stage of anæsthesia shorter and less profound in degree, and according to Dr. Wood there is rarely, if ever, anæsthesia before the period of complete unconsciousness. The same authority also states that even in a prolonged ether anæsthesia there is no material diminution of the blood pressure in the circulation until manifest failure of respiration has taken place. We have thus to come to the conclusion that, at any rate as regards dogs, ether is a safer agent to employ, even though from its primary effects it may cause more trouble to administer.

Its contra-indications may be summed up as follows:

1st.—In operations about the mouth it produces a large secretion of mucus, which may both interfere with the operator, or by some misadventure find its way to the trachea.

2nd.—In operations which must be quickly undertaken and completed, the delay in the administration of ether must be taken into account, as also in cases where profound anæsthesia is not necessary, we have the first stage of chloroform anæsthesia, which does not occur to the same extent in ether.

The action of ether in the horse is very slow, and many cases require a large amount before anæsthesia can be produced.

I have notes on one experiment on an aged gelding, incurably lame from disease of one fore foot.

In this instance ten ounces were inhaled before sensation was lost, taking an interval of fourteen minutes before being fit for any operation.

Neurotomy was performed in one fore leg, and in five minutes after the operation the animal was on his feet. The ether in this case was administered by means of Carlisle's inhaler, in amounts of two ounces each time. I am of opinion that in its administration a large amount should be given at one time, as otherwise a long time is taken up in waiting for the anæsthetic effect. Ether causes great acceleration of the respirations, but very little alteration in the character of the pulse in proportion to the former.

Its exciting effect is well seen in dogs, but not to the same extent in horses ; and another important point to be noticed is the rapid manner in which the stage of anæsthesia passes off as compared with chloroform.

Taking all our present knowledge into account, we must say that of the two agents, chloroform is to be preferred for the production of anæsthesia in the horse.

However, as we become more familiar with the actions and uses of both, it is highly probable that we may discover that combinations of these with others, or together, may prove safer or more beneficial; and this is a point on which discussion may be brought to bear with benefit.

We are convinced, however, from experience that ether is to be used in preference in canine surgery, especially in cases where from any inherent weakness we may fear danger from the other agent.

We have next to consider the mode of administration of chloroform to the horse for surgical purposes. Up to the present, for various reasons, the best apparatus in use is Carlisle's inhaler.

It is easily adjusted to the horse's head; a small amount of drug suffices, as little air is admitted, and there is no waste of the agent used; the latter is also easily replenished if required. We know from experience that if air be allowed to mix with the chloroform, the animal takes a long time to go under its influence, and also that a large amount of preliminary struggling takes place.

It is a safe maxim in its administration that a proper amount should be at first allowed, rather than small amounts often repeated, which tend to saturate the system before the stage of anæsthesia is reached.

We have then to consider the following points:

1st.—The amount of the drug to be administered at first.
2nd.—The recognition of the proper stage of anæsthesia.
3rd.—The symptoms of approaching danger.
4th.—The interval which elapses before perfect consciousness returns.

The heart should be carefully examined for indications of cardiac disease.

It is well to keep the horse from bulky food and from water for some hours prior to administration. The animal should then be carefully cast in as well ventilated a place as possible.

I regard it as a dangerous practice to administer the drug standing, as there is great risk incurred by reason of the chances of the animal falling in a helpless manner.

The inhaler should then be adjusted over the muzzle in a proper manner, the lid having been first withdrawn. It is well to have the sponge in the lid damped, as this prevents the drug being wasted.

For an adult horse one ounce is now poured on the sponge and the lid replaced.

For younger horses this amount may be reduced in proportion, but, as before remarked, it is a mistake to commence with too small an amount.

Here it may be remarked that with reference to all the points to be considered in the process of administration, no hard and fast rule can be laid down, as a great deal depends on individual peculiarities and susceptibilities. Some horses take a much larger amount than others before a proper stage of anæsthesia is produced, but we are safe in taking the average at one ounce.

The recognition of the proper stage of anæsthesia, and the period of time required for this, are matters of great importance.

Here also we cannot lay down any fixed rule, but have to remark that no hurry be indulged in.

As before stated, there is a brief period of chloroform anæsthesia during which quick operations may be performed, but for most operations the proper period has to be produced.

The period of time varies from ten minutes of inhalation to fifteen in some cases, though I have on record cases where five minutes of inhalation sufficed before operating.

The recognition of the proper stage certainly cannot be determined by watching the eye. As I have shown before, this organ may appear sensible to touch when anæsthesia is complete enough for any operation. If the animal does not struggle when the limbs are moved, or when pricked with a

pin, we may conclude that he is fit for operation. We must, however, be aware of the fact that such a thing as involuntary movements of the limbs occur, even when the animal is under deep anæsthesia; and we frequently notice this during operations, especially castration.

If the anæsthesia requires to be continued, or if the first amount does not produce the effect desired, it may be repeated in doses of half an ounce.

It is always advisable to measure the amount of the agent used, also the time the animal takes to go under, and the duration of the period of anæsthesia.

The symptoms of approaching danger, or rather those which demonstrate that the animal has inhaled more than enough, are represented by the character of the respirations.

We must admit that in some horses the effects are much more quickly produced, and take longer to pass off than in others; and hence we must be careful to at once stop the administration when the respirations become any way visibly disturbed in character.

Chloroform often causes acceleration of the respirations at first, but this acceleration is regular; it is when the respirations become irregular and shallow that the administration is pushed too far. Not that any fatal termination is to be feared, because, as we have before shown, alarming symptoms may present themselves, and still the animal will recover without any aid.

With reference to this point I may draw attention to an experiment which I lately performed, where a horse received six ounces, in amounts of two ounces each at intervals, making up a space of twenty-six minutes. Here the greatest distress in respiration was shown, the inspiratory movements being shallow and irregular, and after a time the breathing was almost entirely oral; there were convulsive movements of both fore and hind limbs. In eight minutes after the inhaler was removed, and in six minutes after this the hobbles taken off. After an interval of twelve minutes the horse was up on his feet without assistance. The whole time occupied in this experiment was about fifty-one minutes. But as we can only draw conclusions from such experiments, we are by no means to infer that, should any unfavourable symptoms by any chance arise, we should not take steps to counteract them.

Such measures should consist in cold effusions to the head, and, if necessary, artificial respiration should be resorted to.

The importance also of an abundant supply of fresh air should not be lost sight of.

The subcutaneous injection of ether has found favour with some, but I have not seen any beneficial effects from its use.

The inhalation of nitrite of amyl is recommended by authorities in human medicine, but not having given it a trial I cannot speak of its effects.

The last point which requires consideration is the period of time which the animal takes to recover from the effects of the anæsthetic, and when the hobbles can with safety be removed.

This period is by no means constant, but we may take the average at about twenty minutes.

Some horses recover from the influence of the drug in a shorter period, but we must be very careful not to remove the hobbles too quickly, remembering the danger of the animal injuring itself in its attempt to rise, before the system has recovered itself.

As examples of the expeditious manner in which some animals can be operated on while under the influence of chloroform, I refer to the following notes :—

1st.—Yearling colt, for castration.—After being cast with hobbles, half-an-ounce of chloroform was administered with Carlisle's inhaler ; after five minutes sufficient anæsthesia was produced, the animal was secured on his back, the operation performed by torsion, and the animal allowed to rise in fifteen minutes.

2nd.—Three-year-old horse, in high condition, to be fired on both hocks for bone spavins.—Cast and secured and one ounce of chloroform administered, after five minutes fired one hock, turned over, gave another half ounce, fired the other hock. Animal up in fifteen minutes; whole time occupied twenty minutes. No struggling or sweating, and no after effects noticeable.

When we come to consider the question of the administration of chloroform to the dog, as before remarked, a different state of affairs altogether is found to exist.

Every practitioner who has had experience in this subject will recollect how quickly mishaps will occur, even with the use of every care and attention.

Although I prefer chloroform to ether in the dog, I am bound to admit that it is a dangerous agent in many cases.

Our only chance in administering it with safety is to allow a large proportion of air, and to be careful to avoid undue haste, and also to allow the animal as much scope for breathing as possible.

A plain handkerchief and sponge is safer than any form of muzzle for administration, and from one to two drachms of chloroform will be required, according to the size of the dog.

After the period of preliminary excitement, dogs usually go under very quickly, and the respirations must be very carefully watched.

If the respirations become at all shallow, artificial respiration should be at once resorted to.

Having destroyed a large number of dogs with chloroform, I can confidently state that in every case the respirations ceased first, and the heart continued to beat for some time afterwards.

From this we should come to the conclusion that even when a case seems hopeless, our efforts should not relax, and along with continued artificial respiration, taking care that the tongue is pulled well forward, we may try the application of the vapour of ammonia, and also of amyl nitrite.

We may now consider the uses of cocaine as a local anæsthetic.

Not having had much experience with this drug, I cannot bring forward its advantages or its disadvantages.

I have used it in a few cases in operations about the eye with success, but have found that a five per cent. solution has little effect in removing pain during the removal of tumours of a fibrous nature.

I used it once in the dog for the removal of a small fibrous tumour in the region of the thigh, using a ten per cent. solution subcutaneously, when before the operation was commenced violent convulsions commenced, with frothing from the mouth, champing of the jaws, and rapid death.

The subject of local anæsthesia is one of great interest and importance in our profession, and I shall be pleased to hear a full discussion among those who have had experience in the use of agents which have been found to produce the condition of local anæsthesia, as for minor operations the advantages are obvious.

We may now consider the operations in which the use of anæsthetics can be employed with advantage in veterinary surgery.

As almost all the operations are attended with pain, we can safely say that there are few for which we can claim exemption.

In the castration of yearlings, with the exception of those which are well bred, the operation takes so short a time, and

the structures to be divided are not fully developed, so that we may not consider it necessary to employ an anæsthetic; and this would be far more the case if we are able to perfect the method of operation by ligature of the spermatic artery, whereby a minimum of pain is inflicted.

But in the castration of adult horses it is clear that, both from a practical and humane point of view, the use of chloroform is indicated.

Here we have the shock to the system superseded, the absence of sweating and struggling, the danger of hernia of the intestine through the abdominal ring reduced to a minimum, and every chance given to ensure against hæmorrhage, by whatever mode we perform the operation.

In the castration of cryptorchids, no one can deny that the use of an anæsthetic is an integral part of the success of the operation, and that by the quietude induced, and the absence of shock, we are reducing the risk of that fatal result, viz., peritonitis.

The other operations commonly performed in veterinary surgery, wherein anæsthetics are indicated, do not need to be enumerated, as their painful nature is sufficiently palpable.

There are two instances, however, coming under the notice of the practitioner, where the use of an anæsthetic would be of service, although they may be considered outside the domain of surgery.

I refer to cases of difficult parturition, where from excessive labour-pains it is almost impossible to render manipulation of much service. Here the administration of chloroform will be of the greatest benefit.

Again, in cases of severe abdominal pain, such as that due to enteritis or volvulus, where we often find that the administration of opium or its alkaloid morphia fails to give relief. The inhalation of chloroform, although not saving the patient's life, will give the unfortunate sufferer temporary ease from pain, and in hopeless cases may be continued, rather than allow it to struggle incessantly until death closes the scene.

We may also draw attention to the use of chloroform in cases where muscular action or spasm have to be overcome, such as reduction of herniæ and dislocations.

In conclusion, I may state that I am conscious of many omissions of important matters in this paper, but I trust you will make up for these by an able discussion, remembering that these notes were written in moments snatched from the daily routine of a general practitioner's life.

Editorial.

CANADIAN CATTLE AND CONTAGIOUS PLEURO-PNEUMONIA.

If we recur once more to the subject of Canadian cattle, and the supposed existence of contagious Pleuro-pneumonia among them, it is because of its importance to one of our most loyal and prosperous colonies, and also to the serious professional differences that exist, and which are strongly commented upon, not only in the public press, but have given rise to protracted questionings and discussions in our legislature. We are not now so much concerned with the political as with the scientific aspect of the matter, and it is on this we desire to make a few comments, taking the statements recently made by the Minister of Agriculture for particular notice.

Last month, in referring to the differences in opinion among certain veterinary experts, as to whether certain Canadian cattle imported into this country, were really affected with this disease, or with another which could be mistaken for it, we remarked that it was somewhat strange that inoculation had not been resorted to, in order to aid in solving the mystery surrounding the diagnosis of the malady. The reason for this omission is given in the reply made to a member in the House of Commons by the Minister of Agriculture, as given in our Parliamentary Intelligence. He stated that inoculation experiments had been frequently considered by him, in conjunction with his veterinary advisers, and he should certainly have had recourse to so simple a method of determining the matter if any reliable results could be obtained. "I am advised, however," he went on to say, "that the effects of inoculation with the liquid exuded in pleuro-pneumonia vary considerably. Indeed, it not unfrefrently happens that no local or constitutional disturbances are produced, and, moreover, the same local results have been produced by other material capable of setting up infective inflammation. In these circumstances, the experiments proposed would obviously not afford any reliable test of the character of the disease."

This reply those who understand the pathology of contagious pleuro-pneumonia must consider eminently unsatisfactory, as it is unsupported by anything like scientific proof. The disease is specific in its nature, and inoculation with the

virus from the lungs of an animal just killed has a specific and easily-recognised effect in the bovine species—an effect which the virus of no other disease will produce, and which rarely indeed fails. Those whose experience in inoculation with this virus—experimental and prophylactic—has been most extensive will testify to this fact.

What has to be complained of in this instance, is that inoculation has not been tried; so that the opinion given by the Minister of Agriculture is merely founded on suppositions.

Would the fluid from the lungs of cattle affected with simple pleuro-pneumonia produce the same results as that from the specific disease? That is the whole gist of the matter. It is asserted by the Canadian veterinary experts and others that the animals destroyed were not affected with the contagious disease, which exists nowhere in the Dominion; while it is maintained by our Agricultural Department that they were suffering from the communicable malady. Surely it would be only fair to resort to a test which those who have had great experience in its application consider as of great value. The reply of the Minister of Agriculture will not bear serious examination with regard to the results of inoculation, as there is no evidence, so far as we are aware, to support it. Canada has not been justly dealt with, and the evidence on which her cattle are debarred from admission into the United Kingdom is, to say the least of it, of a very dubious character. Surely when so much public money is being spent in combating this disease, a few pounds might be spared in elucidating a question connected with it which, from a political and pathological point of view, is causing much discussion, not to say discontent.

We must remember that extraordinary notions have been held among high-placed Veterinary authorities in this country from time to time with regard to this disease, which anyone can see who studies its history, and it is to be apprehended that these fantastic notions have not yet quite disappeared, if we are to accept the statements of the Minister of Agriculture as proof.

What is urgently required is the presence of one or two members of the veterinary profession in the House of Commons, who understand such topics, and who would be able to point out the unreliability—nay, absurdity, of such replies, which make us more or less the laughing stock of better informed communities.

THE REQUISITE INSPECTION OF ANIMALS INTENDED FOR FOOD, PRIOR TO AND AFTER DEATH, WITH THE MOST HUMANE MODES OF SLAUGHTER.*

BY PROFESSOR MC FADYEAN, M.B., B.SC., F.R.S.E.

PART I.—MODES OF SLAUGHTER.

EVERY right-thinking person must admit that it is man's solemn duty to take care that no unnecessary pain is inflicted in taking the lives of animals destined for human food. Of course, in this sentence much depends on what is meant by the word unnecessary. We can conceive of methods of killing animals that would be well-nigh painless, as, for example, by chloroform narcosis or carbonic acid poisoning; but even if such methods were free from objection on the ground of injuriously affecting the meat as an article of diet, the most humane person would hardly contend that the trouble and expense of carrying them out do not relieve us from the duty of adopting them. The most sensitive conscience will probably be satisfied when assured that the pain inflicted in the act of killing is momentary, or at least of very brief duration.

It may, therefore, be laid down at the outset, that in deciding what mode of slaughter is the best, our choice ought to be restricted to methods that entail sudden loss of consciousness, and, therefore, only momentary pain. If a number of such methods stand at our disposal, then our preference ought to be given to that which is the simplest in execution, the least expensive, the least injurious to the carcase, and the least liable to miscarriage or accident. In the light of these general principles let us briefly pass in review the methods of slaughter that are commonly practised, or that have been recommended.

Cattle.

1. *Stunning, followed by Bleeding.*—This is by far the most common method of slaughter among civilised people at the present day. The animal is first stunned or felled by a blow delivered on the cranium, and the large vessels at the root of the neck are then opened with the knife. A variety of instruments are in use for accomplishing the first of these steps, those most commonly employed being the common pole-axe, a heavy mallet or hammer, and the Bruneau mask.

The pole-axe is an instrument too well known to require any description. The method of using it is as follows. In some slaughterhouses a rope is fastened round the horns or neck of the animal, passed through a ring in the wall, and drawn tight so as to steady the animal's head; in others the blow is delivered without the preliminary tying up. The operator, standing at the level of the animal's shoulder, brings the handle of the pole-axe well back over his own shoulder, seizes a favourable moment when the head is still, and delivers a blow with all his might on the middle of the forehead. If the blow is properly delivered the cylindrical part of the pole-axe is driven through the frontal bone into the cerebrum, and the animal immediately drops. There can be no doubt that the loss of consciousness is immediate, and the pain only momentary, but forcible irregular movements on the part of the limbs are generally executed after the animal falls, and these, to an uninstructed by-stander, are apt to be taken for an expression of pain. It is a common practice to abolish this by passing a cane through the hole made in the cranium, and using that to break up the brain and upper part of the spinal cord. As soon as movement has ceased, or even before that, a large incision is made at the lower end of the jugular furrow, so as to divide the large vessels at the entrance to the chest.

* A paper discussed at the meeting of the National Veterinary Association on July 26th.

Sometimes the operation is varied by delivering the blow over the occipital bone behind the line of the horns, or between that bone and the atlas. In this country the frontal region is almost always selected for the blow, but when animals are wild, and there is a consequent difficulty in taking a good aim, the occipital stroke is often practised. When the animal drops, one or more blows are delivered on the frontal region.

Instead of the pole-axe, a mallet, heavy hammer, or the blunt end of a common axe may be used, but in large slaughterhouses in this country these are seldom or never employed.

The Bruneau mask was invented in 1873 by M. Bruneau, of Paris. It consists of a leather mask to cover the forehead and eyes, and provided with straps to fasten it on the head. A steel plate is let into the middle or frontal part of the mask, and lies flat on the frontal bone when the mask is in position. This steel plate in turn is perforated mesially by a strong iron tube about 4½ inches long and nearly 1¼ inches in diameter, which is intended for the reception of a six-inch cylindrical iron bolt. When the mask is fastened in position the deep end of the bolt rests on the skin over the interfrontal suture, while the other end projects for an inch and a-half from its tubular sheath. This outer end has the form of a flat roughened head, and when it is struck with sufficient force with a wooden mallet the deep end of the bolt is driven through the frontal bone into the cerebrum. The effect is, of course, just the same as when the perforation is made with the pole-axe, and, if desired, a cane may be passed through the opening in the skull and guided into the upper part of the spinal cord.

The advantages of this instrument over the pole-axe or mallet is obvious; there is much less risk of missing the proper spot in the skull, or miscalculating the force required, and this is especially the case when the operator is inexperienced. The disadvantage of the mask is that its application occupies a certain amount of time, and in the case of wild or excited animals is attended with some risk to the person attempting to put it on. When dealing with quiet animals, and when the instrument is handled by a man experienced in using it, the pole-axe is little, if at all, inferior to the Bruneau mask.

2. *Bleeding without previous Stunning.*—This method is occasionally practised in killing animals that are already down and unconscious or unable to rise from disease or injury, in which case the large vessels are opened at the entrance to the chest, just as after ordinary pole-axing. It is also the method of slaughtering cattle enjoined by the Mosaic law, and practised by the Jews at the present day. The Jewish method of bleeding is as follows. The animal having been cast and placed on its back, the head is made to rest on the horns, and forcibly extended so as to make tense the structures on the lower (in the natural position) aspect of the neck. The priest or rabbi then takes a knife with a long straight blade, and as sharp as a razor, and by means of a rapid sawing motion he severs all the textures of the neck down to the vertebral column. There are thus divided not only the great vessels of the neck, but also the windpipe and gullet. There are few sights more revolting than this Jewish method of slaughter. Needless to say, the animal retains consciousness until a large quantity of blood has escaped (one to two minutes), and its struggles during that time—struggles that are obviously caused by pain and terror—are most painful to witness. The flesh of animals killed in this way contains little blood, and its keeping qualities are therefore good, but that is an advantage which, at least in the eyes of a Christian, cannot for a moment be weighed against the manifest cruelty of the operation.

"*Pithing.*"—This is the method of slaughter practised in Madrid, Barcelona, St. Petersburg, and one or two French towns. The butcher stands in front of the animal, depresses its nose with the left hand, and thrusts a poniard-like knife into the space between the occiput and the atlas, severing the cord at its

junction with the medulla. The animal instantly drops, and it is then bled. Absolutely nothing can be said in favour of this method. It demands a large amount of skill and experience on the part of the operator, it is attended with more danger to the operator, and it is doubtful whether loss of consciousness is instantaneous. Besides, it is said that animals thus killed do not bleed well.

Shooting.—This is sometimes practised in slaughterhouses by means of Siegmund's pistol mask. That has a headpiece somewhat similar to the Bruneau mask, but carries in its frontal part a pistol barrel, loaded with a ball. The pistol is charged by means of a slight stroke with a hammer. The objections to this instrument are that it is more complicated and extensive than the Bruneau mask or pole-axe, that it carries a certain amount of danger (through accidental discharge) to those working with it, that in large slaughterhouses the repeated detonation is apt to alarm and excite the animals waiting to be killed, and that the ball sometimes ploughs its way for a long stretch from the skull, and thus disfigures and injures the carcase. Bleeding is, of course, necessary after the animal has dropped.

Calves, Sheep, and Pigs.

These are almost invariably killed by bleeding without previous stunning. Sometimes, in the case of sheep, after the throat has been cut the head is forced backwards and the spinal cord is severed by passing the point of the knife into the occipito-atlantal joint from below. Pigs are usually bled in the same manner as cattle after having been stunned with a mallet, hammer, or club; but not rarely the latter step is omitted. Kleinschmidt has invented an instrument, on the principle of Bruneau's apparatus, for use in stunning calves, sheep, or pigs. The sheath that carries the bolt is fixed at the end of a handle, instead of forming part of a headpiece, and while this is held over the forehead the bolt is struck with a mallet. It is difficult to recognise in this instrument any advantage over the ordinary club or pole-axe.

One cannot help being struck with surprise at the small amount of attention that has been given to the methods of slaughtering the smaller animals, compared with that which has been devoted to introducing more humane methods of killing cattle. There can be no doubt that if butchers in this country were to give up the use of the pole-axe in favour of the Jewish method of killing cattle, a public outcry and probably an Act of Parliament would soon compel them to revert to the more humane procedure, and yet public opinion placidly permits butchers everywhere to kill sheep by a method which differs in no material way from the Jewish one. It seems as if people naturally fell into the belief that the sufferings from any given injury must be proportional to the animal's size. The killing of an elephant by cutting its throat in full consciousness would, if measured by the volume of blood that escaped and the struggles of the animal, be a more revolting sight than the slaughter of a sheep in the manner practised daily in our abattoirs, but there is not the least reason to suppose that the smaller animal would suffer any less agony than the larger one. On this matter it is scarcely possible to come to any other conclusion than that butchers adopt a more humane method of killing cattle mainly because of its convenience and safety to themselves. How can we otherwise explain the fact that adult cattle and pigs are generally killed by a comparatively painless method, while the inoffensive sheep and calf are subjected to a mode of death that entails needless suffering? It is no doubt true that when death results from hæmorrhage pure and simple less blood is left in the body than when the animal is first stunned and then bled; but a few ounces of blood left in the carcase of a healthy animal need not, except by a Jew, be regarded as in the least detrimental. Besides, if a pig can be sufficiently bled while unconscious, it may be accepted as certain that a sheep can also.

The kingdom of Saxony has in this matter set an example which other civilised nations would do well to follow. By an order issued on the 21st March 1892, it is decreed as follows :—

1. In the slaughter of all animals, except poultry, bleeding must be preceded by stunning. This law does not apply to the necessary slaughter of animals on account of accident or sudden disease, if in the actual circumstances the stunning cannot be carried out.
2. In the case of cattle the stunning must be carried out by means of the mask ; but an exception may be made in the case of young animals.
3. Calves, sheep, and swine must be stunned by means of a blow on the frontal or occipital region ; but the choice of the instrument is left to the butcher.
4. In all cases, save where owing to accident or disease the animal must be killed immediately, the slaughter must be carried out by an experienced person, or under his guidance and assistance ; never by a learner by himself.
5. The slaughter of animals must be conducted in enclosed buildings not accessible to the public. Only when these are not available may animals be killed in the open, and even then the operation must not be visible from public places, streets, or highways. With the exception of apprentice butchers and assistants, no person under sixteen years of age shall be permitted to be present at the slaughter of animals in an abattoir.
6. Persons transgressing this regulation shall be liable to a fine of 150 marks, or imprisonment.
7. It shall be the duty of the local police to call the attention of butchers to the foregoing resolutions, and to intimate to them that an opportunity to learn the various methods of stunning animals, and the instruments used for the purpose, will be afforded at the slaughter-houses.

Part II.—The Requisite Inspection of Animals intended for Food, prior to and after Death.

Before proceeding to discuss what are the best methods of conducting the inspection of animals slaughtered for food purposes, it may be advisable to consider whether, and on what grounds, such inspection is required at all. It is not to be expected that any member of the National Veterinary Association will go so far as to contend that an absolutely free and uncontrolled traffic in butcher meat ought to be permitted. The daily press and the medical journals frequently bring under our notice instances in which animal flesh scandalously unfit for human consumption has been sold or offered for sale, even in places where an attempt is made to control the meat traffic ; and it is easy to imagine the extent to which unwholesome meat would be sold if the present imperfect checks were withdrawn. In discussing the necessity for a sanitary control of the meat trade, there is no need to trench on the debatable ground of diseases that are in this connection only slightly dangerous, or perhaps not dangerous at all. We know that there are diseases of cattle, sheep, and pigs that render the flesh of these animals highly dangerous to those who consume it, or who even handle it. No one would have the hardihood to contend that when a farmer loses an animal from anthrax he ought to be at liberty to send the carcase to market, or that a butcher ought to be allowed to retail tubercle bacilli with the meat that he sells. Everyone must therefore admit that some sort of control is necessary, and that is admitting the whole case ; at least there does not appear to be any logical middle course between a general system of inspection and no inspection at

all, for unless meat is to be inspected everywhere there can be no guarantee that it is not dangerous. In one town or district there might be enforced a general and thorough system of inspection, but the effect of that might be in great measure nullified if dressed carcases were freely admitted from places where there was no inspection at all.

It has been objected by some that it is impossible, on the ground of trouble and expense, to carry out a system of general meat inspection, and it has been declared impracticable to control the meat trade in small towns and villages in the same way that it can be done in cities. These objections have not been supported by any solid argument, and they appear to have been raised on the extravagant supposition that it would be necessary to build a large and expensive abattoir in every village that has or requires a butcher's shop, and to appoint in connection with it a skilled inspector of meat with a handsome salary. This, of course, is absurd. At all abattoirs where the number of animals slaughtered is sufficient to give employment to a meat inspector, one ought to be appointed; but in the case of very small towns and villages the local veterinary surgeon, without devoting his whole time to the work, could inspect all animals slaughtered for food, and that without materially adding to the rates.

If it is conce ed that meat inspection is necessary in the public interest, the next question to be considered is—By whom is the meat inspection to be carried out? Before answering that question, or, indeed, by way of answering it, it may be well to consider what the inspection of meat, when properly conducted, really means. The main object of meat inspection is to exclude from the market all flesh of an unwholesome character. Such unwholesomeness of meat may be due—

(1) To the presence of pathogenic bacteria capable of exciting specific diseases, such as anthrax or tuberculosis;
(2) To the presence of animal parasites that naturally spend one stage of their existence in the human body, as, for example, the trichina spiralis, the cysticercus cellulosæ, &c.;
(3) To the presence of poisonous substances (albumoses, ptomaines), generated by bacteria. Such poisons may be generated in the living animal by pathogenic organisms, or in the tissues after death by saprophytic or putrefactive bacteria.

Thus, with the single exception of meat rendered dangerous by *post-mortem* change, the unwholesomeness of flesh is the consequence of disease in the animal furnishing it; and hence the inspection of meat mainly resolves itself into a search for the lesions or marks of particular diseases of the lower animals. Who is the proper person to conduct this search? Not, surely, the policeman nor the butcher, nor the medical officer, but the veterinary surgeon. No person who has grasped what is the object of meat inspection can entertain any doubt on the point. France, Germany, and other countries have settled this matter some time ago, and it is practically settled in this country too. A public body who at this date employs a policeman or a butcher as a responsible inspector of meat is guilty of a great outrage on common sense.

It may not be out of place here to point out that while it is the legitimate and natural function of the veterinary surgeon to act as the inspector of meat, that does not give him a title to determine whether any given disease renders the flesh of an animal affected with it unfit for human food. That is a totally different question, and one in the settlement of which the medical profession must naturally have a preponderating voice. If we are to have a system of general inspection of animals slaughtered for food, its introduction ought obviously to be accompanied by an authoritative tabulation of those morbid conditions that are to be regarded as rendering flesh unwholesome.

The discussion of that matter, however, would be out of place in this paper, which has to deal only with the methods of inspection.

Inspection Prior to Slaughter.

Save in the case of foreign animals slaughtered at the port of debarkation, inspection prior to slaughter is nowhere carried out in this country. That, of course, is not surprising, considering that there are very few places where there is even *post-mortem* inspection worthy of the name. There can be no doubt, however, that *ante-mortem* inspection of animals to be slaughtered for food is a most valuable safeguard against the sale of unwholesome meat. It may be of interest here to quote the law on this point in the Grand Duchy of Baden. The regulations relating to meat inspection in that State ordain that cattle, horses, sheep, goats, and swine, must be submitted to the examination of a meat inspector, both before and after slaughter, in every case in which it is intended to sell the flesh for human food. With this object, some hours' notice of the intended slaughter must be given to the inspector. The only admitted exceptions to this rule are animals killed by the owner for the use of his own household, and animals whose flesh would be rendered unfit for food if slaughter were not carried out immediately, *e.g.*, animals with wounds, fractures, sudden tympanites of the stomachs, parturition accidents, &c.

The wisdom of such a regulation is obvious. It might be said that a *post-mortem* inspection, if properly carried out, ought to act as a sufficient safeguard, but we know that there are diseases and morbid conditions which, although very important as regards their effect on the fitness of the flesh for food, are not attended by any gross lesions in the carcase, especially when the slaughter is carried out before the animal is *in extremis*. No stronger proof of the wisdom of *ante-mortem* inspection could be cited than the fact that most recorded cases of meat-poisoning have not been in connection with the flesh of animals killed in abattoirs, but through eating the flesh of animals slaughtered in emergency, or while at the point of death from disease. One thing appears certain, viz., that when an animal has not been submitted to an *ante-mortem* examination, the inspection after death ought to be of an unusually searching nature; and if the carcase presents any evidence that the animal has been at the point of death before it was slaughtered, it ought to be condemned.

As regards the method of conducting the examination before slaughter, little need be said. When the inspection is conducted at an abattoir the animals ought to be allowed some hours to recover from the excitement or exhaustion commonly caused by exposure in a market, or by railway or steamboat transit. The usual signs of health should be looked for, and, in the case of cattle, it would be well to make a practice of taking the temperature.

Inspection after Slaughter.

This must be treated of under two heads: (1) the inspection of animals killed in the local abattoirs, and (2) the inspection of carcases introduced from without. With the last may be included the supervision of the sale of meat in the butchers' shops.

(1.) The inspection of animals killed in public abattoirs ought to be made at the time of slaughter. In short, the slaughter ought to be conducted in the presence of the inspector or inspectors. No doubt there are great difficulties in the way of doing that in most places at the present time, owing to the number of inspectors that would be required where there are numerous private slaughter houses. Even in places where private slaughter houses are not allowed, as in Edinburgh, for example, a proper supervision of the slaughter may be difficult or impossible without an unreasonably large staff of inspectors. That must be the case in all large public abattoirs that are not

constructed on the "Hall" system, as opposed to the "Chamber" system. Everyone who has had any experience in connection with meat inspection, knows how quick and skilful butchers are in disposing of evidence of disease when the inspector's back is turned, and the only way of preventing the deception is to have the slaughter conducted under the eye of the inspector. The so-called meat inspection which consists in looking at the dressed carcases after the butcher has completed his day's work, when most or all of the viscera have been put out of the way, deserves to be characterised as a huge deception. Can one imagine a medical man being seriously asked to conduct a *post-mortem* examination of a human body *minus* the viscera, with a view to discovering the cause of death? And yet it is just as ridiculous for a veterinary surgeon to certify the fitness of a carcase for human food when he has had no opportunity to examine the internal organs.

If it is not possible to conduct the inspection while the animal is being skinned and eviscerated, the next best thing is to insist that the organs and their lymphatic glands shall be submitted to examination along with the carcase.

The order in which the various parts and organs are to be inspected is to some extent determined by the customary procedure of the butcher in dressing the carcase, at least when the inspection is made immediately after slaughter. When the examination is delayed until the butcher has completed his operations with the carcase, the inspector may examine the organs in whatever order he finds most convenient, but it is all-important to follow some definite order, and not to conduct the examination in an irregular haphazard manner. This is a point which is not sufficiently enforced in some text-books on meat inspection. The following is suggested as a convenient order for the inspection in the case of cattle:—

1. *Skin.*—If an *ante-mortem* examination has been made, the inspection after death will be directed mainly to the detection of subcutaneous ecchymoses or extravasations due to bruising, &c.

2. *The Feet.*—For lesions of foot-and-mouth disease particularly.*

3. *The udder and supra-mammary lymphatic glands.*—The quarters of the udder ought to be criticised in respect of volume and resistance on palpation, and an incision ought to be made into each, exposing the milk cistern and gland substance. The supra-mammary glands ought to be incised, and searched for tuberculosis or other lesions.†

4. *Peritoneal cavity.*—For the escape of dropsical or inflammatory fluid.

5. *Intestines and mesenteric glands.*—Examination of the former has to be restricted to external inspection and palpation, unless these reveal the evidence of lesions in them. The mesenteric glands ought to be incised and searched for tuberculous lesions, the presence of pentastomata, acute inflammatory lesions, &c.

6. *Stomach and omentum.*—The former both externally (for tuberculous lesions) and internally (for evidence of inflammation), the latter for tuberculosis, tumours, &c.

7. *Spleen.*—Particular attention to be paid to the volume and consistence (Anthrax). Both it and the splenic lymphatic glands ought to be incised. In case of splenic "tumour," the spleen pulp ought always to be examined microscopically for bacteria.

*It ought always to be remembered that while the main purpose of meat inspection is to prevent the sale of unwholesome meat, an obligatory general inspection would be a valuable check on the spread of contagious and infectious diseases among the lower animals.

†In examining lymphatic glands, it ought to be made a rule to make a number of close parallel cuts, otherwise tuberculous lesions may easily be overlooked. A knife that has been soiled through cutting into a tuberculous gland, an abscess, or the like, should afterwards be sterilised before it is used for cutting any edible part of the carcase.

8. *Liver.*—Examine as to volume, colour, and consistence on palpation. Look for dilatation or thickening of the bile ducts. Make one or two deep incisions in the posteria face, and inspect the lobules. Cut into the portal glands.

9. *Kidneys.*—Examine as to size, colour, and consistence. Divide lengthwise, so as to expose the kidney substance and the renal pelvis.

10. *Uterus and bladder.*—The former externally for tuberculosis, internally for retained placenta, putrid fluids, inflammation, &c. The latter by external inspection.

11. *Chest and pericardium.*—For escape of inflammatory or dropsical fluids.

12. *Heart and lungs.*—Numerous incisions to be made into the bronchial and mediastinal glands. The lungs to be thoroughly searched by palpation for tuberculous or other nodular lesions. echinocorcus cysts, &c., and then to be incised. Heart to be examined as regards its serous covering, the colour and consistence of the myocardium, and the presence of bladder worms. Both ventricles to be opened so as to afford a view of the endocardium and the valves.

13. *The Head.*—Nose; cavity of the mouth, including the tongue; submaxillary and pharyngeal lymphatic glands; internal phrygoid muscle to be incised and examined for cysticercus inermis.

14. *The Carcase.*—First on its external or dorsal aspect, and then as regards the walls of the great cavities. On the former look for evidence of œdema, blood extravasation, bladder worms, etc. On the interior examine first the parietal peritoneum, and then the parietal pleura, not forgetting that concealed by the diaphragm. Look particularly for evidence of "stripping." Examine the muscular tissue as regards its colour, consistence, and odour. Lastly, examine the prepectoral lymphatic glands, and the bones of the vertebral column and sternum.

Order of examination in other animals.—With very slight modification, the plan above sketched for the inspection of cattle is applicable to the inspection of calves, sheep, and pigs. In young calves the umbilicus and liver should be carefully examined for evidence of omphalo-phlebitis, and in the case of pigs a particular search must be made for bladder worms (cysticercus cellulosæ). Ostertag says that the commonest situations of the bladder worms in the pig are: the muscular part of the diaphragm, the tongue, the heart, the plerygoid muscles, the intercostal muscles, the neck muscles, the pectoral muscles, and the adductor muscles of the thigh; and he recommends that all these ought to be incised and examined. The vertebral column and sternum of the pig ought to be carefully inspected, owing to the frequency with which the pig's skeleton is the seat of tuberculous lesions.

Examination for the Trichina Spiralis.—This demands a special paragraph to itself. If we may judge from the rarity with which human trichinosis occurs or is recognised in this country, there is little occasion to demand an obligatory trichina inspection such as is carried out in some of the German states. Is the rarity of human infection with us ascribable to the disease being rare in British pigs, or is it rather due to the fact that bacon and pork are seldom or never in this country eaten raw? No certain answer can be given to this question, but one may hazard the guess that the last suggested explanation is the correct one. In any case it would be wise to take every opportunity of spreading among the people the knowledge that this is a danger to which only those expose themselves who eat pork that is raw or very imperfectly cooked.

A naked-eye inspection is valueless for the detection of the trichina spiralis, and since a large number of microscopic preparations must be examined from each carcase before it can be pronounced free from the parasite, trichina inspection becomes enormously expensive to carry out. The staff engaged

exclusively in this work in the Berlin abattoir comprises: 184 microscopists, 48 persons to cut out the pieces of muscle to be examined, and 16 markers, while the annual cost of the inspection is about half a million marks (£25,000).

The method of examination in Berlin is as follows. Six pieces of muscle, each about the size of an oat seed, are excised from four separate places, viz., the pillars of the diaphragm, the abdominal muscles, the intercostal muscles, and the muscles of the larynx. These twenty-four small pieces of muscle are arranged in series between two thick microscopic slides, which can be approximated by means of a screw at either end. The pieces of muscle are by this means flattened out until they are thin enough for microscopic examination. A microscope magnifying 20–40 times is used for searching the pieces of muscle, and the time spent on the series from one pig is eighteen minutes. The method of examining preserved bacon or pork is the same, save that a little dilute acetic acid is used to moisten the pieces of muscle.

(2.) As previously mentioned, the safeguard afforded by a properly-conducted inspection of the animals killed in the public abattoirs in any given locality may be to a large extent nullified by the importation into that locality of carcases from a town or district in which no proper inspection is carried out. If a general system of meat inspection were enforced all over the kingdom, this difficulty would disappear, except in the case of foreign meat. At the present time, however, all the dead meat brought into a locality from without must be regarded as demanding inspection quite as much as the carcases of animals slaughtered in the public abattoirs of that locality. Moreover, while this dead meat requires inspection, the means of forming a judgment regarding its fitness for food are often absent, inasmuch as generally the bare carcase is presented for examination. It has already been pointed out that a trustworthy opinion regarding the wholesomeness of a carcase cannot be formed in these circumstances, and until we have an obligatory meat inspection throughout the kingdom, towns that insist upon an adequate inspection of animals killed in their own abattoirs ought to have power to prevent the introduction of carcases from outside places, except when they are accompanied by at least the lungs, heart, spleen, liver, and kidneys.

While it must be admitted that the inspection of a dressed carcase is a very imperfect means of ascertaining whether the meat is wholesome, or whether the animal was the subject of disease, it is, nevertheless, a means that must be employed in lieu of a better, and where properly carried out it is at the present time instrumental in arresting the sale of a large quantity of meat that would be very dangerous to the consumer. As regards the order of the inspection little need be said. Evidence of disease has to be sought for in the carcase, just as when that is submitted to examination in the course of a complete inspection—that is, after an examination of the organs; and it may be here remarked that absence of the pleura or peritoneum from places where it naturally occurs ought to be regarded as evidence of disease. There are, however, two things that have always to be very specially looked for in this kind of inspection, viz., signs of putrefaction, and evidence that the animal had died, or been slaughtered while at the point of death from disease. Putrefactive changes may be recognised by the odour of the flesh, by the Eber's chloride of ammonium test, or by microscopic examination. The second of these is now officially recognised in the inspection of carcases at Berlin. It is practised as follows: a mixture containing one part of hydrochloric acid, three parts of alcohol, and one part of ether is poured into a tall, narrow, cylindrical glass to the height of 1 cm. The stopper of the glass is then inserted, and the mixture is shaken up. A glass rod is drawn over the surface of the suspected meat, or a small particle of flesh may be made to adhere to the end of the rod, and the stopper having been slowly removed, the glass rod is lowered into the vessel, keeping it away from the

sides, until the end is within 1 cm. of the acid mixture. If putrefaction has begun, a cloud of chloride of ammonium is formed at the end of the rod, by combination of ammonia evolved from the decomposing flesh with the vapour of hydrochloric acid in the vessel. With the same quantity of fluid the test can be made many times over. It is worthy of note that the method is not serviceable as a test for putrefaction in the case of salt-water fish, since ammonia is given off from these in the fresh condition.

Microscopic examination of a cover-glass preparation stained with methyl-blue would demand more time, but would probably give indications of equal or greater value than Eber's test. It must be remembered that poisonous qualities may be communicated to flesh by the growth in it of organisms that do not render it at all offensive in smell. Microscopic examination might be trusted to reveal these as well as putrefactive bacteria, and it may be laid down as a safe rule that flesh containing bacteria of any sort in considerable numbers ought to be condemned.

In judging whether a carcase belongs to an animal that has died from disease, or been killed at the point of death, attention should be given to the colour and firmness of the flesh, to the amount of blood in the smaller veins, and to evidence of commencing putrefaction, especially about the abdomen.

It is obvious that even in a locality in which no flesh is sold except that furnished by animals carefully inspected before and after slaughter, unwholesome meat might still find its way into the hands of the consumer, viz., through the meat, otherwise wholesome, having been kept too long in the possession of the butcher. There is, of course, only one way of counteracting this, and that is to make frequent but irregular inspection of butchers' shops, and to impose severe penalties for offering for sale meat that is manifestly spoiled.

PREVENTIVE INOCULATION AGAINST ANTHRAX AND SWINE PLAGUE IN HUNGARY.

A REPORT issued by the Hungarian Minister of Agriculture with regard to the operations of the Pasteur-Chamberland Laboratory, shows that in 1892, 806,932 animals were protectively inoculated, or nearly 200,000 more than in the preceding year. Since its institution in 1886, this laboratory has supplied material sufficient to inoculate 1,237,674 pigs, and so to protect them against Swine Plague; while enough has been furnished to inoculate 1,122,558 horses, cattle, sheep, etc., against anthrax.

PROHIBITION OF THE IMPORTATION OF HAY AND STRAW FROM RUSSIA INTO GERMANY.

A TELEGRAM from Berlin states that the German Minister of Agriculture has issued orders prohibiting, until further notice, the importation of hay and straw from Russia into Germany. The reason given for this step is that the import trade in these agricultural products, which has sensibly increased of late, may bring with it the cattle disease and other epidemics into Germany. It has been found impossible to determine whether the imported hay and straw come from the infected districts of Russia or not. The present high price of these products, however, seems to justify the conclusion that they come from the more remote parts of Russia, where the cattle disease is almost permanent. This decree comes into force on the 25th of this month, up to which date all the hay and straw, which have already been purchased for importation in the less distant districts of Russia, may be brought across the frontier. After the decree comes into force, the authorities may make exceptions to the rule in favour of agriculturists who live near the frontier, if it can be indubitably proved that the hay and straw come from non-infected districts.

BOVINE CONTAGIOUS PLEURO-PNEUMONIA IN CANADA.

It is stated that the Board of Agriculture have declined the invitation of the Canadian Government to institute an independent inquiry respecting the existence or non-existence of pleuro-pneumonia in the Dominion. The suggestion was that the Home Government should appoint two experts, who were to proceed to Canada for the purpose of making an exhaustive investigation on the spot, the entire expense of the investigation being defrayed by the Dominion. The decision of the Board of Agriculture was communicated to the High Commissioner by Mr. Herbert Gardner, Minister of Agriculture.

MEAT INSPECTION IN RUSSIA.

Veterinary-Surgeon Gurin, Abattoir Inspector at Moscow, has published an interesting report on meat inspection in Russia, which appears in the *Zeitschrift für Fleisch-und Milchhygiene* for July, and in the *Revue Vétérinaire* for August of this year. From this report it appears that until 1882 there was no official or public abattoir anywhere in the Russian Empire. If the large towns had slaughter-houses they were private concerns, and were not under veterinary surveillance. But in 1882 a public abattoir was established in St. Petersburg, in 1885 another was founded at Odessa, in 1886 at Kiev, in 1888 at Moscow, in 1890 at Voronezh, Tula, and Astrakan, and in 8892 at Saratov and Kazan. The three abattoirs at Warsaw are private speculations. Orel has instituted a public abattoir this year, and others are being constantly inaugurated at Charcov, Jahroslav, Kursk, Kostloma, and other towns. An imperial edict compels municipalities throughout the empire, and even burghs in which many cattle are slaughtered, to establish abattoirs.

All the above-mentioned abattoirs have been established at the expense of the municipalities, and placed under the surveillance of the municipal veterinary surgeons. The cattle have to be inspected both before and after slaughter. For a long time the regulations impose inspection not only at the places from which animals are sent, but also those at which they arrive, and especially at the large railway stations, more particularly with a view to the detection of contagious diseases, and notably the cattle-plague.

In addition to the cattle killed at the abattoirs, the cities also receive in winter much meat from the provinces. In this way Moscow and St. Petersburgh consume, under the latter head, the flesh of 150,000 cattle, and Kazan and Saratov 20,000. In the two last-named cities, as well as in Kiev and Odessa, the foreign meat undergoes inspection; but the lungs are not required for examination, and it is, therefore, difficult to judge as to the state of health or disease of the animals from which the flesh was obtained.

The Tartars, who chiefly inhabit the eastern and south-eastern provinces, consume much horse-flesh. In their villages there are no butchers, each person killing his horse at his own convenience and without the formality of inspection. But at Kazan, where there are about 30,000 Tartars, an abattoir has been opened for horses alongside of that for cattle, and in this about 4,000 horses are sacrificed annually. There is also a horse abattoir at St. Petersburgh, but none at Moscow, where the Tartars are few, and where only a small quantity of foreign horse-flesh finds admission, but is not inspected.

By virtue of the law which prohibits the sale of the flesh of diseased animals for public consumption, that which is derived from those that had been affected with cattle-plague, anthrax, actinomycosis, or which showed a hyperthermia exceeding 40 degs. Cent. is destroyed. In cases of aphthous fever and pleuro-pneumonia, only the diseased parts are destroyed if the temperature of the animal did not reach 40 degs. There is no regulation interdicting the sale of the flesh of too young animals; but as a rule none are killed under fifteen days old.

With regard to tuberculosis, the measures vary according to the localities, and seizure is sometimes partial, sometimes total.

In some towns the municipality allows the owner of the condemned animal a certain amount of compensation. At Moscow this is ninety per cent. the value of the flesh; elsewhere it is fifty per cent.

THE PASSAGE OF MICROBES THROUGH THE PLACENTA.

THE *Recueil de Méd. Vétérinaire* for August 15th states that at the second session of the Société Obstetricale de France, held in April last, Dr. Chambrelent, of Bordeaux, related his new investigations into the passage of microbes through the placenta. These investigations dealt not only with the microbe of fowl cholera, but also with others of larger dimensions, such as the *streptococcus*, *staphylococcus aureus*, and the *bacterium coli*. The doe rabbit was chosen for his experiments, because since the researches of Professor Mathias Duval, the histology and histogeny of its placenta are perfectly well known. Infection was realised by intravenous injection and subcutaneous inoculation, while the experiments were made at various periods of gestation.

In all cases the microbes found their way through the placenta, and were found either in the embryo or the fœtus, no matter what the phase of gestation was. Their presence was even detected in the cartilages—a circumstance which explains the occurrence of certain congenital affections of the skeleton.

Chambrelent doubts whether the anthrax bacterium could pass through the placenta, because of its size; and he does not know how the other pathogenic germs traverse it. He is certain, however, that their passage is not due to any previous alteration in the placenta, as no trace of this was to be found in any of his preparations.

It is superfluous to insist on the importance of these facts in view of the explanation they furnish with regard to the transmission of contagious diseases from mother to fœtus. If Professor Nocard had been aware of them last year, when writing his article on Tuberculosis for the *Dictionnaire de Médecine, de Chirurgie et d'Hygiène Vétérinaires*, he would probably not have asserted "on nait tuberculisable; on ne nait tuberculeux." It seems to us that the observations of Jöhne, Malvoz and Bromvier, Crokor, and Galtier, merit more credit, so far as the frequency of placental contagion is concerned.

THE FIRST INTERNATIONAL VETERINARY CONGRESS OF AMERICA.

WE have pleasure in announcing that the thirtieth anniversary of the United States Veterinary Medical Congress and First International Veterinary Congress of America, will take place during the Universal Exhibition at Chicago in the month of October of this year. All foreign veterinarians who will present their names before September 15th will be made honorary members. The membership fee is fixed at two dollars, and will entitle each member to all the publications of the Congress. Application should be made to the Secretary, W. Horace Hoskins, 3452-54, Ludlow Street, Philadelphia, Pa., U.S.A.

We earnestly hope a large contingent of British veterinarians will avail themselves of this opportunity of making the acquaintance of their American colleagues, who are certain to give them a hearty and fraternal welcome to that great country. We believe that, in the words of the circular announcing the intention of holding the Congress, "This project will mark in the New World an event of the highest importance, the success of which will contribute to the elevation of the profession throughout the world."

PROTECTIVE INOCULATION OF THE HORSE AGAINST TETANUS.

TIZZONI AND CATTANI (*Rif. Med.*, June 8th, 1893), publish a first report on this subject, into which they have been inquiring by the aid of a subsidy from the Italian Minister of Agriculture. The vaccination experiments were carried out on two horses, and were commenced by an injection of 5 c.c. of "first vaccine," which consisted of a gelatine culture of tetanus grown in an atmosphere of hydrogen, and attenuated in a manner the details of which are promised shortly. The attenuation was such that hypodermic injections of 4 and 5 c.c. respectively were no longer capable of producing tetanic phenomena in a rat or rabbit. Four c.c. in a single injection, however, proved a perfect vaccine for the rat, while 15 c.c. in two injections, at five days' interval, was efficient in the case of the rabbit. In the first horse the injections were as follows:—January 15th, 5 c.c. of first vaccine; January 20th, 8 c.c. of first vaccine; January 25th, 14 c.c. of first vaccine; February 1st, 18 c.c. of first vaccine; February 11th, 24 c.c. of first vaccine. February 22nd, 0·3 c.c., February 27th, 1·5, March 7th, 3·0, March 14th, 6·0, March 23rd, 12 c.c., of a culture of which 1 drop killed a rabbit in 7 to 8 days. April 6th, 10 c.c. of culture, of which 1-200th drop killed a white rat in six days. No further injections were made, and the other animal was treated in practically the same manner. The only phenomenon following these injections was the appearance of œdema at the seat of puncture, accompanied by redness of varying intensity. The effusion gave the animal no great pain, was at its height about two days after the injection, and subsided entirely within four to eight days from its appearance. There was, besides, a certain amount of general reaction in the shape of fever, but this was never of great intensity; after the final injections, too, there was some loss of flesh, from which the animals recovered within a week or so. After the first two injections there was also an increased muscular irritability, especially discernible in the subcutaneous muscles. Finally, the animal was found to be immune to the most virulent tetanus which could be obtained, and the experiment was therefore a complete success. Another interesting fact is also made out in the course of the experiments—the increase of the immunising power of the animal's serum after each injection. This can be well seen in the following Table:—

Day of Experiment.	Amount of Vaccine and Virus used.	Immunising Power of Serum.
25	45 c.c.	Antitoxic *in vitro*
43	69 c.c.	1:5,000
51	70.8 c.c.	1:50,000
58	73·8 c.c.	1:100,000
67	79·8 c.c.	1:250,000
81	91·8 c.c.	1:500,000
97	101·8 c.c.	1:5,000,000

The figures in the last column represent the fraction of a cubic centimetre of the antitoxic serum necessary to protect each gramme of a rat from the results of inoculation with a virus which kills a control animal in four or five days. A question closely allied to the above was to test whether the serum had a curative as well as an immunising power. This was tested by inoculating rats with 1-25th of a drop of a culture of tetanus bacilli, which was known to be fatal to such animals in this dose within five days. On the

second day symptoms of tetanus began to be manifest; an injection of the horse serum ($\frac{1}{2}$ c.c.) was given under the skin of the back—serum which had acquired an immunising power of at least 1:500,000. The symptoms remained localised but not much altered for about five days, after which they gradually subsided, so that a cure was complete within twenty-five days. Finally, the authors suggest that the reason that they have been more successful than other observers in obtaining both antitoxic and curative results lies in the fact that the cultures of the tetanus bacillus at their disposal have been far more active than those of other laboratories. They hold that the activity of the antitoxin is directly proportional to the strength of the virus by the aid of which it is produced. Having thus succeeded in producing a great antitoxic value in the serum of the horses under experiment, they are about to utilise the large amount of material thus available in attempts to cure tetanus in large animals, such as the horse, an animal in which the disease so frequently occurs.—*British Medical Journal.*

SURGICAL SIGNIFICANCE OF DUST.

DURING the first years of the antiseptic era, the atmosphere was held responsible for many of the septic conditions developed in wounds which we have since learned to attribute to other causes. In those times, no operation, however trivial, was undertaken without the use of the spray, and the utmost attention was paid to keeping the wound protected from the air. The perfection of our antiseptic technique and the excellent results of the septic method have served to relegate the doctrine of air infection to the background, as is evidenced by the almost universal abolition of the spray during surgical operations. Thanks to the advance made in bacteriology, it is now recognised that the sources of wound infection are far more often to be sought in neglect of cleanliness, unclean hands and instruments, and improperly prepared dressings, than in an impure condition of the atmosphere. In other words, the doctrine of direct contagion has supplanted that of infection through the air. It cannot be denied, however, that the condition of the air in operating rooms and sick chambers exerts some influence upon the healing of wounds; and it will, therefore, be of interest briefly to review the results obtained by Dr. Carl Hægler (*Beitrage zur Klinischen Chirurgie*, Bd. 9, 1892), who has made the question of aerial infection the subject of an elaborate bacteriological investigation. The stimulus to undertake this extensive work was furnished by two cases of erysipelas, for which no cause save aerial infection conld be assigned. An examination of the air and dust of the ward occupied by these patients revealed a number of pathogenic organisms, chiefly staphylococci and streptococci, the virulence of which was shown by inoculation experiments on animals. Want of space forbids us from going into the details of the author's subsequent investigations of the air of operating theatres, hospital wards, lecture rooms, laboratories, etc., which were undertaken with extreme care. In all these places, pathogenic microbes were found in comparatively large numbers, and in view of this fact, Hægler concludes that the air must be considered as one of the factors of wound infection, although not a prominent one. The manner in which these organisms are disseminated in the air is not difficult to understand. Staphylococci and streptococci occur in normal saliva and nasal mucus, and by spitting and sneezing become mixed with atmospheric dust. They are found on the superficies of the body, in the normal urethra, in the finger nail dirt, etc. They reach the air, however, in far larger numbers from the surface of suppurating wounds or dressings which have been in contact with them.

Since the dry aseptic method of wound treatment has come into vogue, and

moist dressings are less employed, the danger of admixture of pathogenic organisms with atmospheric dust is greater than formerly, owing to the fact that during the removal of the dry dressing, particles of desiccated pus are frequently carried into the air, while this is less likely to happen if the wound be kept moist. Although these sources of atmospheric contamination are acknowledged by many authorities, most of them assume that the organisms are so rapidly destroyed in the atmosphere that they cannot prove injurious. Hægler's experiments show, however, that streptococci and especially staphylococci preserve their vitality for a long time in the air in a dry state. He remarks that atmospheric infection frequently becomes a contact infection, the germs falling into the wound from the air, the hair, and the clothes of the operator and assistants, and being rubbed into the tissues by instruments, sponges, etc.

From his experiments the author deduces the practical conclusion that a thorough moistening of the air with steam—not by an atomizer—frees it almost completely from microbes within a comparatively short time; and that wetting the floors, walls, and furniture of the room prevents a fresh contamination of the air. The time required to purify the air will depend upon the rapidity with which the room can be filled with steam. During removal of dressings, especially if they be dry, there should be as little movement in the room as possible, so as to avoid stirring up dust. If dry dressings have been employed, they should be moistened before removal, so that particles of pus crust may not be disseminated in the air, and the dressings should be placed in moist receptacles and burned.—*International Journal of Surgery.*

FITZWYGRAM PRIZE COMPETITION.

EIGHT candidates entered for these prizes. The theoretical portion of the examination was held in London and Edinburgh on the 22nd June. The practical and *viva voce* was held at the Royal Horse Infirmary, Woolwich, on the 7th July.

At the theoretical examination in Scotland one candidate failed to attend, and in London one candidate retired at anatomy.

The following is the result :—

M. Hutchison, First Prize, £50, New Veterinary College, Edinburgh.
H. G. Bowes, Second Prize, £30 " " "
J. P. Stewart, Third Prize, £20 Dick " " "

The examiners were Veterinary-Captain F. Raymond and Professor W. A. Edgar.

ARTHUR W. HILL, *Hon. Sec.*

PRESENTATION TO MR. THOMPSON, M.R.C.V.S., ASPATRIA, CUMBERLAND.

WE are pleased to learn that at the conclusion of the Aspatria Agricultural Show on August 9th, the directors and shareholders of the Aspatria Agricultural College assembled in the tent to make a presentation to Mr. Henry Thompson, M.R.C.V.S., Aspatria, in recognition of his zeal and perseverance in promoting the welfare of the college. Mr. H. Howard presided, and among those present were Mr. S. Foster, Sir Wilfrid Lawson, and others of the directors, with a large gathering of persons interested in the presentation.

Mr. Foster, who made the presentation, said he was asked to make the presentation, because for some years past he had been the chairman of the directors of the Aspatria Agricultural College when it was in the hands of a company. The presentation comprised a piano and a gold watch and chain. The inscription on the watch was: "Presented to Mr. Henry Thompson, M.R.C.V.S., together with a piano, by the directors and shareholders of the Aspatria Agricultural College for his zeal in promoting the welfare of the

institution from its foundation," and on the piano there was something of the same sort. By the liberality of the shareholders they were enabled also to thank Mr. Thompson's wife and daughters. He had there a brooch, which was presented with the best wishes of the shareholders, to Mrs. Thompson, and there was also a travelling clock for Mr. Thompson's elder daughter, and a ring for his younger daughter. Whatever Mr. Thompson had taken in hand since he came to Aspatria had always succeeded. The agricultural show was got up mainly through the instrumentality of Mr. Thompson, and the Agricultural College would have been nowhere, he could tell them as chairman of the directors, without the invaluable assistance of the same gentleman. Mr. Foster then handed the watch and chain to Mr. Thompson, and wished him long life and happiness to wear them, and also handed to him the gifts for his wife and daughters.

Mr. Thompson made a suitable acknowledgement, and gave a sketch of the origin and progress of the college, as well as of himself, his remarks being well received.

Army Veterinary Department.

His Royal Highness the Commander-in-Chief has selected Veterinary-Major I. Matthews, Royal Horse Guards, to succeed Veterinary-Major J. Reilly in the Army Remount Establishment.

Veterinary-Captain R. Pringle has arrived at Aldershot with the 2nd Dragoons from Dublin.

Veterinary-Captain J. T. Dillon accompanied the 17th Lancers to Aldershot from Hounslow, and will, after the manœuvres, proceed with that regiment to Preston.

Veterinary-Lieutenant C. E. Nuthall accompanied the 1st Dragoons from York to Dublin.

Veterinary-Lieutenant H. M. Maxwell accompanied the 6th Dragoon Guards from Edinburgh to York.

Veterinary-Lieutenant F. Joslen accompanied the 1st Dragoon Guards from Windsor to Norwich.

Veterinary-Lieutenant E. J. Lawson accompanied the 4th Hussars from Colchester to Aldershot.

The undermentioned veterinary officers will embark during the season for a tour of service in India :—Veterinary-Major F. F. Crawford, Veterinary-Captain F. Smith, Veterinary-Lieutenants E. E. Martin, H. B. Knight, C. B. Freeman, H. T. Sawyer, J. Farmer, A. Smith, G. M. Williams, A. E. Clarke, W. N. Wright, and the following veterinary officers will be relieved, having completed a tour of service in India :—Veterinary-Lieutenants E. Taylor, W. R. Walker, A. J. Haslam, M.B., and F. W. Sharp.

Parliamentary Intelligence.

HOUSE OF COMMONS, July 25th.

PLEURO-PNEUMONIA AND CANADIAN CATTLE.

In answer to Dr. Farquharson,

Mr. H. GARDNER said: If any further cases of pleuro-pneumonia are discovered among cattle imported from Canada, I should be quite willing to take the same course as that pursued in connection with the recent cases, viz., to give facilities for the examination of the lungs by any veterinary surgeon appointed by the Canadian Government, and to supply them, so far as is practicable, with sections of the diseased portions. The suggestion made by my hon. friend as to carrying out inoculative expriments, has been frequently considered by me in conjunction with my veterinary advisers, and

I need scarcely say we should certainly have had recourse to so simple a method of determining the matter if any reliable results could be obtained. I am advised, however, that the effects of inoculation with the liquid exuded in pleuro-pneumonia vary considerably. Indeed, it not infrequently happens that no local or constitutional disturbances are produced, and, moreover, the same local results have been produced by other material capable of setting up infective inflammation. In these circumstances the experiments proposed would obviously not afford any reliable test of the character of the disease.

CANADIAN CATTLE.

Sir JOHN LENG asked when the papers relating to the examination of the lungs of Canadian cattle by the veterinary experts of the Board would be laid upon the table, and what they would include.

Mr. GARDNER: I hope to lay the papers in question upon the table in the course of next week, but correspondence is now proceeding between the Colonial Office and the Board of Agriculture which it is desirable should be included. If the Canadian Government and the Colonial Office see no objection, I should propose to print the whole of the correspondence to which my hon. friend refers, and with a view to the inclusion of the reports of the Canadian inspctors, I have suggested that they should be officially communicated to me.

Mr. W. WHITELAW asked the President of the Board of Agriculture whether he would allow several cargoes of Canadian cattle to be landed in this country and kept in quarantine, under the strict observation of the Board of Agriculture, for such time as the Board should consider necessary, in order to prove beyond dispute whether or not reasonable security existed for their free importation.

Mr. GARDNER: I am afraid that the arrangement proposed would not be of much assistance in connection with the matter to which the hon. member refers. The detention of cargoes for the lengthened period necessary would involve great practical difficulty, and even if no cases of disease presented themselves amongst the animals detained, it would only prove that diseased animals are not comprised in every cargo, a fact which is already beyond dispute.

July 27th.

CATTLE DISEASE IN ENGLAND.

Colonel WARING asked the Minister of Agriculture whether there was any truth in the rumour of the outbreak of some unknown cattle diseases in England during the last few days. He might add that the disease had been described as rinderpest.

Mr. GARDNER: No, Sir; I have received no information of any outbreak of the rinderpest or other disease.

EXPORT OF HAY FROM AUSTRIA-HUNGARY.

In answer to the Marquis of Carmarthen,

Sir E. GREY said: The exportation of hay from Austria-Hungary has been stopped, and her Majesty's Government have made urgent representations that contracts entered into previously to this prohibition should be excepted from its provisions. It is understood that this matter is still under consideration at Vienna and Budapest.

July 28th.

THE IMPORTATION OF CANADIAN CATTLE.

Mr. BUCHANAN asked the President of the Board of Agriculture whether the Canadian Government had invited the Board of Agriculture to send out experts to Canada at the expense of the Canadian Government to determine whether

contagious pleuro-pneumonia did or did not exist within the Dominion, and whether he would accept the offer, and thereby help to allay the dissatisfaction that was felt at the maintenance of the present restrictions on the trade.

Mr. GARDNER: We have not received any formal invitation from the Canadian Government to the effect indicated in the question, but we have on more than one occasion considered whether the adoption of the course proposed would be the best means of obtaining evidence as to the existence of pleuro-pneumonia in the Dominion. My own opinion is that the Canadian Government could themselves obtain additional information which would bear materially on the question at issue, and as my hon. friend will see from the papers about to be laid on the table, we have offered important suggestions as to the means by which we think this might be done.

August 1st.

COST OF SWINE FEVER.

Mr. CHAPLIN asked what was the estimated cost of the execution of the Swine Fever Bill in England and Ireland during the present and the next financial year respectively; and what would be the limit of Imperial funds at the disposal of the Board of Agriculture and of the Lord Lieutenant and the Privy Council in Ireland during those periods for the purpose of the Bill.

Mr. GARDNER: It is not possible for us to make any very close estimate of the cost of the execution of the Swine Fever Bill by reason of the uncertainty which exists as to the real extent of the disease, but, on the assumption that during the period from November 1 to March 31 next we have to deal with 100 outbreaks per week in Great Britain and an aggregate of 800 in Ireland, we estimate the *maximum* cost at £104,700 and £32,000 respectively. It is too early for us as yet to make any precise estimate for the year 1894-5, and before it is requisite for us to do so, we shall, I hope, be in possession of some experience of the actual working of the measure, but I may say that assuming that during that year we have 4,000 outbreaks to deal with in Great Britain and 1,400 in Ireland, the figures submitted to me show a total estimated expenditure of £193,600 and £60,000 respectively. I hope, however, that the actual expenditure may fall as far short of these amounts as fortunately proved to be the case with pleuro-pneumonia. The Imperial funds available to meet the expenditure up to March 31, 1895, will be the balances on the pleuro-pneumonia account, which at the moment we estimate at £92,700 and £40,000, and a sum not exceeding £50,000 to be provided by the Chancellor of the Exchequer for the purposes of the Bill.

August 3rd.

THE IMPORTATION OF CANADIAN CATTLE.

Sir J. LENG took the opportunity to bring before the House the question of the continued importation of live cattle from Canada. He reminded the President of the Board of Agriculture that the recent determination of the Board to uphold the slaughtering order, notwithstanding the fact, as he alleged, that both Scotland and Canada were free from pleuro, had caused great agitation in Scotland. Large meetings of farmers and cattle dealers had been held in Arbroath, Montrose, Aberdeen, and Dundee, and others were to be held within the next few days in the counties of Perth and Fife. The reason for holding those meetings was that unless the order was promptly revoked it would be fatal to the most important branch of the importations—that of young cattle for feeding purposes—for the remainder of the present year, as the season for shipments from Montreal closed early in November. In the early part of the season the cattle brought were almost entirely fat cattle, and the only harm done so far had been in depressing the markets,

more particularly in Glasgow, by killing meat in large quantities when not required. From this time forward, however, when the young cattle from Canada were desired and would be welcomed by Scottish farmers as the healthiest and most profitable cattle they could put into their fields and byres, they were to be prevented from obtaining them. And what was the pretext? The fear of importing infectious pleuro-pneumonia. If he thought that fear was well grounded he should not utter a word of complaint. No one, and least of all the intelligent farmers of Scotland, desired anything that would facilitate the introduction of such a scourge of their fields and steadings, such a pestilence as infectious pleuro was too well known to be. Of all men they had the greatest interest in keeping their herds healthy. They were the last to wish the business on which they so much depended for their livelihood to be imperilled or destroyed. But they did not believe that any real case of infectious pleuro ever had been imported from Canada. There were two supposed cases last autumn, and there had been this year a single supposed case from the Lake Winnipeg. But Scottish farmers, supported by several of the most eminent veterinary experts in Scotland, did not believe that these were infectious cases at all. From the beginning distinguished Scotch veterinaries had declared that microscopic examinations of the lungs had shown the characteristics of the disease to be those, not of contagious pleuro, but of broncho-pleuro, or "corn-stalk disease," which was neither infectious nor contagious, and they quoted the authority of M. Nocard, the celebrated French veterinary, in support of their positive statements. There was no infectious pleuro in Canada. The Dominion was entirely free from it, and, on the principle *ex nihilo nihil fit*, infectious pleuro could not come from a country where there was no infection. Sir Charles Tupper, the High Commissioner for Canada, said, three weeks ago, that it once did occur in a valuable herd, the whole of which was slaughtered, as were all the animals for five miles round. It was insinuated that cases of infectious pleuro might dribble into Canada from the United States, but the Canadians, to prevent this, had established and carefully enforced a quarantine of 90 days for all cattle coming from the States. According to the testimony of all who had purchased young Canadian stores, as well as of the butchers who had killed the fat cattle, they were the healthiest that came into the market, the most free from all kinds of ailments. It would be very desirable, for this reason, to have them to improve our own breeds. The history of the animal brought by the Lake Winnipeg, whose case decided the Board of Agriculture to continue the slaughtering order, was well known. It did not come from the United States. It came from Pilot Mount, Manitoba. It came a distance of 1,500 miles, along with 250 others, closely packed in railway trucks to Montreal. Then it came between 2,000 and 3,000 miles across the Atlantic in a steamer to this country, in close contact again with others, under conditions most favourable to the propagation of infection if it had existed. If that animal had had infectious pleuro it must have infected those with which it was in contact in the train or in the steamer. It was contrary to all experience that there should be a solitary case like that. An infectious disease was known by its spreading infection. Like smallpox it could not be hidden; it would spread and make itself known. But it had not spread either in Canada or in this country. According to the President of the Board of Agriculture, the United Kingdom had not been so free from cattle disease for many years as it was now, although 14,000 Canadian cattle were dispersed all over the country last autumn after the restrictions were first announced; and although the lungs of 25,000 Canadian cattle had been inspected this year, those of only one animal had been condemned for supposed pleuro. This part of the case might be fairly summed up in the words of resolutions passed at a large meeting of agriculturists in Dundee on Tuesday, protesting

"against the continuance of the restrictions on the importation of cattle from Canada, being of opinion that neither was their imposition nor is their continuance warranted by the circumstances of the cases on which they were founded"; that "therefore, a great injustice has been done to Canada and the agriculturists and general community of this country," and "that the effect of these restrictions, if maintained, will be to increase instead of diminishing the risk of the dissemination of disease through the exclusion of Canadian cattle, which are the healthiest that can be imported." The Board of Agriculture was the creature of statute, and its procedure was regulated by statute. The general law was that all animals imported from abroad shall be slaughtered at the port. Up to last year Canadian cattle had such an excellent character that they were excepted from the rule, but in November last the exception was revoked, and they came under the common prohibition, and were not now allowed "to be moved alive out of the wharf." It was against this that the farmers and dealers in Scotland protested, being of opinion "that the imposition and continuance of the restrictions were due entirely to the mistaken and disputed diagnoses and course of procedure of the veterinary advisers of the Board of Agriculture, whose investigations are conducted in secret and are not subject to review"; and that "the decisions in regard to suspected cases of infectious or contagious disease should not, as hitherto, rest solely with the Board's present veterinary advisers without the right of appeal, but that the President should avail himself of the best skill and advice to be had either in this or other countries." There was undoubtedly a strong feeling that, however able and experienced the departmental advisers of the right hon. gentleman might be, he had placed himself too much under their control, was too subservient to their opinions, and had not sufficiently exercised his own independent judgment. There were two sets of opinion, held by two sets of veterinaries, with respect to these cases of pleuro, but the President of the Board of Agriculture had shut his eyes and closed his ears to all but one set—those held by his own subordinates. The question involved the live or death of the trade in live Canadian cattle, and it seriously affected the agriculturists both of Scotland and of Canada. The almost universal opinion of both countries was that the veterinaries of the Board of Agriculture were wrong, and yet the right hon. gentleman would not give the slightest heed to any but them. There were well known instances in which the advisers of the Board, both with regard to cattle and horses, had been proved to have made mistakes, but the President accepted their views as infallible, and under the enormous powers with which he was invested, virtually issued in the slaughtering order a death warrant against the Canadian cattle trade. No wonder that both in Scotland and in Canada a feeling not only of irritation, but of exasperation prevailed. It was perfectly clear that, having regard to the whole of the circumstances, the Board was entirely free to act in cancelling the slaughtering order. There was nothing in Clause 2, section 4 of the 5th schedule of the Act justifying the stoppage of the trade, simply because in 25,000 animals examined one supposed case of pleuro had been found. Nowhere on the face of the earth was it possible to get thousands of animals without some of them being in a more or less sickly state. Of course, if any considerable numbers of these Canadian cattle were sickly prejudice would be justified; but all who knew them concurred in testifying that they were the healthiest cattle that passed through their hands. The Act, however, mainly regarded the state of matters in the country from which the cattle came, and whether the laws and regulations of that country for securing the health and "the general sanitary condition of animals therein" was such as to afford "reasonable security against the importation therefrom of diseased animals." It stipulated not for perfect and absolute security, but for reasonable security. He was at a great dis-

advantage in dealing with this question, in consequence of the delay in presenting the reports and papers which the right hon. gentleman promised some weeks ago to lay on the table of the House. Those papers might throw unexpected light upon the case. If so, why had they been held back? As it was the agitation in Scotland called for the fullest explanations the right hon. gentleman could give. How was it that the late President of the Board of Agriculture, when he received a report that a number of Canadian cattle were infected, did not issue such a slaughtering order as his successor had done? The right hon. gentleman had gained much credit in Scotland for refusing to be misled by his advisers, while the present President of the Board of Agriculture had been much disparaged for his action.

Mr. GARDNER regretted that the discussion had arisen without the Committee being in possession of the papers which he promised to the deputation to lay upon the table of the House. The reason those papers had not been presented was not on account of any delay in his Department, but simply owing to a desire on the part of the Colonial Office that subsequent papers should be included from the Canadian side. Notwithstanding this drawback, he welcomed the discussion, for in this matter no one had regretted more than he the position in which circumstances had placed the Department of Agriculture. He recognised also the advantage which the trade of Canada had been to Scotland, but he was anxious to draw attention to what the Contagious Diseases (Animals) Acts had really achieved. Not only had the administration of those Acts been successful, but by their aid they had practically eliminated from Great Britain the ravages and losses from pleuro-pneumonia and foot-and-mouth disease, and had thereby probably saved the agricultural interest of Great Britain millions of pounds in money. What was the reason that those Acts had been so successful? The reason was because the duty of suppressing these cattle diseases had been transferred from a local to a central authority. It was therefore obvious that, owing to the statutory obligation under which he administered the Acts, and his duty as Minister of Agriculture, he had been obliged to withdraw the right of free entry to Canadian cattle, and had thereby placed certain portions of Scotland under a temporary inconvenience and loss. It was in these circumstances natural that the inhabitants of Dundee and Perth should agitate to have this temporary inconvenience and loss removed. The hon. member said that the present situation had been brought about by one solitary case in a large cargo of cattle. That was not so. The present restriction was caused through a sequence of events which began in the autumn of last year. The right hon. gentleman read detailed extracts from a report as to four cases of diseased animals from Canada and one case in Scotland, the facts which had thus been supplied to him leading him most reluctantly to prohibit the free entry of animals from Canada. In consequence of representations from Canada, however, that the country was free from disease, he ordered an exhaustive expert examination to be made in order to see whether some basis could be found on which to open the ports. That examination took place at the beginning of the year, but, unfortunately, the Department found that cases of disease again existed. But the sanitary condition of Canada was not the only condition which they had to look to. There were the laws relating to the importation and exportation of animals to and from Canada, and the prevention, introduction, and spread of disease in Canada itself. It seemed to be the opinion of the hon. member and of others that the Board of Agriculture were in the position of parties to a suit, but that was not so, for they were the judges of the whole matter. Then the hon. member said that pleuro-pneumonia was contagious, like small-pox; but he could not, he thought, have studied this particular disease, which was—unlike foot-and-mouth disease or rinderpest—an insidious and not a violently contagious disease. Pleuro-pneumonia might lie latent for a long period, for more than six

months, and might then be contagious. If animals predisposed to disease came in contact with it they caught it, while healthy animals very often escaped. Therefore, his hon. friend's statement that pleuro-pneumonia was a disease which could not be concealed was not reconciled with the facts of the case. His hon. friend had referred to the animals on the Lake Winnipeg and had remarked that it was an extraordinary thing that none of those animals had caught the disease, but, as only 23 days had elapsed from the time the vessel left Canada until she arrived here, it was extremely unlikely that they would have been affected to any extent, considering that the disease in the most advanced case was concentrated chiefly in one small lobe of the lung. Moreover, these animals were examined by the inspectors of the Canadian Government, and some of them had been rejected. It was admitted by the authorities that disease existed in Canada, and that the animals which had come over here had got a disease. What her Majesty's Government wanted to know was what that disease was. and they should be very glad if the Canadian Government would assist them to find out. Their contention was that the disease which existed in Canada was contagious pleuro-pneumonia, while the Canadians, on the other hand, considered it was not. Her Majesty's Government had asked the Canadian Government to act as they would themselves act in similar circumstances; they asked them to examine the lungs of the animals that had been rejected from these cargoes and to try and trace through their farms, if possible, any animals that had taken this special disease, with a view to stamping it out. In fact, the Government wished the Canadian authorities to come into council with them, and not to say on their own *ipse dixit* that there was no disease in Canada. He gathered from the hon. member and his friends that they were in favour of keeping the disease out of Great Britain, and that they were not opposed to the Acts or to their administration, but that the whole foundation of their case was that the officials of the Board of Agriculture were incapable of performing the duties imposed by the Acts. He reprobated very strongly an attack upon officials who were not able to defend themselves in this House, for he alone was responsible, and he accepted full responsibility for his Department. These officials were three in number, and one of them was a Scotchman, and they had perhaps more experience in this special disease than any other men, for they had examined thousands of lungs. He did not suppose that either the hon. member or his friends in Scotland wished for a moment to impugn the good faith of these gentlemen, who had no interest in the matter one way or the other, and who simply came to the consideration of any particular case with a judicial mind and gave an opinion based on their experience and knowledge. As to the statement that the examinations of lungs had been conducted in private, he would merely say that he had invited the Canadian Government to send representatives to attend these examinations, which took place at the Veterinary College. In the last case, and he believed also in the first case, in respect of which Canada was scheduled the lungs had been examined in the presence not only of the experts, but of other persons acquainted with the disease. He had only one thing to say in conclusion and that had reference to what was being said by certain papers in Scotland. It was said that the importation of Canadian cattle was done in order to favour importations from Ireland. This was hardly deserving of notice. When it was proposed to close all the ports to foreign cattle the Government resisted it, and they were supported by the Irish members. How, then, could it be said that this was done to favour Irish cattle? As a matter of fact, the exclusion of Canadian cattle did not raise the price. What the country required was that the Government should not not relax their energies to protect the flocks and herds of the country. They had made representations to Canada on this matter and they were awaiting the reply from Canada. He hoped a state of things would be brought about which would enable them to

extend to Canada the privilege of free entry, but as things stood they were bound to maintain the prohibition.

Mr. CHAPLIN said the speech of the right hon. member left very little for him to say. The vast majority of agriculturists would approve that speech and the decision arrived at. The hon. member for Dundee said there was a widespread feeling in favour of his motion, but as far as his knowledge went he must give to that statement an emphatic contradiction. (Sir J. Leng: Scotland.) If Scotland wanted more store cattle plenty were to be had from Ireland. The hon. member said that their action had depressed the price of meat in Dundee. He thought the hon. member was a free-trader, and that the last thing he would complain of was that the price of meat was made lower for the people of Dundee. As to the statements that Canada was free from disease, they must all be taken *cum grano.* His experience with regard to the United States showed him that almost without exception these statements were incorrect. He would ask the Committee to consider for a moment what had been done in the past in connection with this question. An enormous sum of money had been spent in the endeavour to extinguish this disease, an object which, he thought, had been practically, if not actually, accomplished. He was quite safe in saying that in the United Kingdom the extirpation of the disease was within measurable distance. But what happened in October last? He did not wish to shirk the blame for it. He admitted he ought to have scheduled Canadian animals earlier. The disease was reintroduced into Scotland, and extended to 70 or 80 centres, and that epidemic was got rid of at a cost of £10,000 or £12,000. It was now suggested that all these results should be thrown away by the readmission of Canadian animals into this country at the instance of the hon. member for Dundee. The question resolved itself entirely into this—Were the hon. member for Dundee and the Scotch farmers to decide what was or what was not contagious disease, or was that question to be left to the veterinary experts of the Board of Agriculture. There was another thing he desired to put very shortly before the Committee, which led him to think it would be the very greatest misfortune if this proposal were adopted. There was no question as to the existence of the disease in the United States, and it would be absolutely impossible to prevent the passage of animals from the United States into Canada. He did not believe that for a long time to come it would be safe in any circumstances to admit animals from the continent of America. That being so, he was strongly of opinion that it was not altogether fair that the head of a Government Department should be responsible for these prohibitions. That responsibility should be taken by Parliament itself, and the best and wisest course of all would be to prohibit by legislation the importation of animals into this country, except for the purpose of slaughter, from any other country in the world.

Mr. BUCHANAN thought those who were in favour of this proposal must recognise the fair way in which his right hon. friend had met them. Accepting as they did the decision of the Board of Agriculture as justifiable in every way in November, they contended that from that time to this the right hon. gentleman had not taken the opportunity he might have taken of keeping the country fully informed of the progress in relation to the matter and the ground on which he still continued to enforce this restrictive order. The Scotch agriculturists wished to know whether precautions could be taken in Canada to prevent the migration of disease from the United States, and also whether the inspection of Canadian cattle when they were put on board could be made more strict. They did not wish the Board of Agriculture to embark on a course that would lead to the reintroduction of disease, but they believed that a restriction which was grievously injuring agriculture in Scotland could be removed with safety.

Sir J. CARMICHAEL urged that the papers on the subject should be presented as speedily as possible.

After the usual interval,

Mr. W. WHITELAW said that the question of the restrictions upon the importation into Scotland of live Canadian cattle, was of enormous importance to the Scotch farmer. He agreed that it would be a great misfortune to this country if diseased cattle were permitted to be imported, but his contention was that Canadian cattle were not only the best for farming purposes that could be imported into Scotland, but that they were the most healthy that could be obtained. It had been alleged that on one occasion a Canadian cow had infected a Scotch cow with pleuro-pneumonia, or else that the Scotch cow had infected the Canadian cow; but he believed that neither of the cows had suffered from that disease, but merely from bronchial pneumonia, which was a comparatively harmless complaint. If pleuro-pneumonia had been prevalent in Canada ten months ago, the disease would have spread in that country in such a degree, that it would have been impossible at this time to have concealed the fact, and yet no information had reached this country that the disease existed in Canada at the present moment. Two deputations had waited upon the right hon. gentleman, the President of the Board of Agriculture, in reference to this subject, and to both of them the right hon. gentleman had returned the same answers, namely, that to adopt the test, they recommended of placing Canadian cattle in quarantine for a certain period would take too long, and that, after all, it would not furnish any satisfactory test. In his own opinion, if the Canadian cattle in quarantine were suffering from pleuro-pneumonia when they were landed, the disease would develop itself in a very short time. If the right hon. gentleman was not satisfied with such a test, would he be good enough to state what test would satisfy him. If the Scotch farmers were made to suffer in this matter for the good of the country at large, the country ought to bear the expense of investigating doubtful cases. There had been undoubtedly cases of pleuro-pneumonia in Ireland, and yet no restrictions had been imposed upon the importation of Irish cattle into Scotland. Even if it were proved that there was no pleuro-pneumonia in Canada, it would be said that it existed in the United States, from which it could be brought into Canada. They were told by the member for Sleaford that it was impossible, in spite of all the precautions that could be taken, to prevent United States cattle from being brought across the frontier. If United States cattle were smuggled into Canada, it must be either by United States dealers or Canadian dealers. If by United States dealers, they would have to smuggle such a large number of cattle in order to make a profit, that they would be sure to be found out. On the other hand, was it to be supposed that Canadian dealers, whose prosperity was bound up with the export trade to this country, would run the risk of ruining their business by sending over diseased cattle? Sir Charles Tupper and the Canadian authorities had stated that there was no pleuro-pneumonia in Canada. He hoped, then, that some definite steps would be taken to have the restrictions removed. With regard to the report, it would be better to have it all together than to have it piecemeal. It would be invidious to produce the English part without the Canadian.

Mr. EVERETT said that in that part of England to which he belonged—the eastern counties—they did not care where the cattle came from, so long as they made money by them. They had had a good many Canadian cattle, and were satisfied with them; but they were most anxious not to have contagious disease imported. They looked with the greatest satisfaction on the legislation with regard to cattle disease. No agricultural legislation had been so successful. He recollected the time when they never bought a lot of cattle without some of them falling down and communicating disease to the

cattle they already had. They were thankful to the last degree for the precautions which had saved their herds from foot-and-mouth disease, and pleuro-pneumonia, and they earnestly hoped that the Minister of Agriculture would stand firm in this matter. They were perfectly willing that the right hon. gentleman should open the ports to Canadian cattle when the scientific information at his disposal showed that it was perfectly safe to do so. When the great pressure that was brought to bear upon him was taken into account, and also the idea prevailing on the Ministerial side that prohibitions were in the interest of protection, he thought the right hon. gentleman was deserving of the gratitude of the whole country. He was very glad that they had got a Minister of Agriculture who had a backbone, and he hoped the right hon. gentleman would keep his head clear and his back straight, and would not yield to the pressure which some hon. gentlemen would put upon him.

Major RASCH said that what the hon. member for Dundee aimed at, was to induce the Government to open the ports to pleuro-pneumonia, as some years ago they had been opened to foot-and-mouth disease, which cost the agriculturists of this country 11 millions of money. If hon. members wanted store cattle, why did they not go to Essex, where there was not food enough for the cattle, and buy them? He supported the policy of the Minister of Agriculture, in the name of his constituents, and he admitted that in carrying out that policy the right hon. gentleman had earned the salary which a grateful country had granted him. In his part of Essex, and in other parts of the eastern counties, the opinion was that the conduct of the Minister of Agriculture had atoned for the *laches* of the Government in other matters.

Mr. FURNESS said he had heard nothing to justify the prohibition of the free entry of Canadian cattle into this country. He was interested in the matter, not in a pecuniary sense, but because he was the first to introduce Canadian store cattle into England. Some years ago he sent out an English agriculturist to report to him on the feasibility of importing store cattle, with instructions to purchase a cargo. He sent out a steamer to Montreal to bring them over, and he distributed them among the farmers in the north of England, keeping some for himself. The result was sufficient to justify the continuance of the trade. Although not in the trade himself, it would be a pleasure to him to see its extension. It had since assumed gigantic proportions, and he had heard nothing from the President of the Board of Agriculture to justify him in practically destroying the trade. As for the right hon. member for Sleaford, he would like to see the importation of cattle destroyed altogether. In this matter the interests of Canada, as well as those of the enterprising north-country farmers, had been ignored entirely. The right hon. gentleman was not prepared to accept the authority of Sir Charles Tupper for the fact that there was no contagious pleuro-pneumonia in Canada at the present time, but they had the evidence of gentlemen interested in the trade that, out of the large number of cattle imported this year, only four cases had been found, and that went to show that there was no justification for depriving the north-country and Scotch farmers of Canadian store cattle, and carrying out a reactionary and protectionist policy. They were told that the veterinary department of the Board of Agriculture were to be the judges, but the trade of this country would never have been built up to its vast dimensions if it had been at the mercy of the officials of any Government department.

Mr. JEFFREYS remarked that the Board of Agriculture deserved the thanks of the whole community for having so well kept out disease from our shores; whereas, if the views of certain hon. gentlemen opposite were carried out, cattle would be at once admitted about which there was great suspicion. Of this the veterinary surgeons of the Board of Agriculture had no doubt. There was no hardship in slaughtering at the ports of debarcation, because

the meat came into the country all the same, and excellent meat it was; and, moreover, it was a mistake to suppose that agriculturists were thereby deprived of store cattle. There was plenty of store cattle in England and in Ireland, and if there was a scarcity in Scotland, which he was surprised to hear, why did not Scottish feeders proceed to England or Ireland and buy store cattle, where they were a perfect drug in the market? He denied that the amendment was in the interests of agriculture; the whole aim of agriculturists at present was to keep their flocks and herds free from disease, and the only way to do that was by placing power in a central authority. What had been accomplished in this way was the most successful thing the Board had ever done. Let hon. members from the North tell their farmer friends to come down to the South of England before the winter came on, and they would get store cattle in any numbers at very low prices indeed.

Mr. CORBETT suggested that the best way to satisfy the Department as to the origin of this disease was by adopting the proposal of Sir C. Tupper—namely, that experts should be sent out from the Department to Canada at the expense of the Canadian Government, to inquire for themselves and see whether the disease existed there. It would be interesting to hear from the President whether the suggestion had been considered and what course he proposed to take. The right hon. gentleman seemed to labour under something like a fair-trade fallacy, because he said the consumer had not been affected by the restrictions placed on importation. It was an axiom with freetraders that you could not put any restriction on the import of our food supply without the consumer being affected. It was possible that the price of a commodity might not rise; and even if it fell, it fell less than it would otherwise do on account of the restriction. The one fear in large towns was that the President would necessarily give more consideration to the demands made by certain agriculturists than he was likely to give to the interests of consumers in the large towns.

Mr. H. R. FARQUHARSON believed the agriculturists of England wished to support the President. This was to some extent a question of town against country. It had been shown over and over again that the question of the importation of live stock could not be considered a question of food supply. Food could be brought over much more easily and cheaply and in a better condition in the shape of frozen meat. With a few exceptions he should like to see the import of live stock put a stop to on account of the cruelty with which the trade was carried on. Most members had read a pamphlet in which Mr. Plimsoll described the cruelties and horrors of the trade. He felt certain the farmers of Scotland could not be so selfish as to wish to run the risk of importing disease into this country. The Scotch farmers had had an exceptionally good year; in England, on the contrary, everything was very bad; and if the President fell in with the desire of the towns and permitted disease to be introduced things would be worse still. The stock of the farmers of England was the best in the world, and many of them would only be too glad to sell to the farmers of Scotland.

Mr. CROMBIE, as representing a purely agricultural constituency in Dorsetshire containing many dairy farmers, desired to support the position taken by the hon. members for Dundee, East Aberdeenshire, and Perth. The President had made a plucky speech, but it would not altogether give satisfaction in Dorsetshire. His constituents wished to know what chance there was of the restriction being removed, and it would give them some satisfaction if a hope could be held out that it would be removed at no distant date.

Colonel NOLAN believed the question was agitated in the interest of shipowners, and said that the Irish farmers did not wish to see disease introduced into this country after the expense that had been gone to to stamp it out.

Mr. GARDNER said it was evident from the debate that this was not a party

question. He regretted as much as anyone that papers had not been laid on the table, but the delay was unavoidable, as it was only that day that a long communication had been received from the Canadian Government. As to his following the advice of his own veterinary advisers, it must be remembered that no other veterinary experts were equally responsible for the advice they gave. If they had made mistakes, the result of those mistakes was that the country was absolutely free from disease. As to the trade of Canada, returns showed that its export of cattle continued to increase. Nothing would give him greater satisfaction than to be able to remove the present prohibition; he should welcome the day when that was possible. He appealed to the Committee not to prolong the discussion and to the hon. member for Dundee not to press his amendment.

Sir J. LENG said, in view of the appeal made to him, he did not propose to press the matter to a division. Regretting as he did that they had not the reports to which allusion had been made, he also regretted that the President did not take the opportunity three or four weeks ago, when the second deputation waited upon him, to offer the explanations he had now given.

The amendment was by leave withdrawn.

August 17th.

ANTHRAX.

In reply to Mr. Jeffreys, Mr. GARDNER said: Anthrax was reported to exist on thirteen farms in England during the week ended the 13th inst. The measures taken to prevent the spreading of the disease are set out in a general order issued by me on the 16th of December last, a copy of which I shall be happy to supply to the hon. member. The disease is due to the entrance into the blood of a minute bacillus which is a species of fungus, and grows from spores or seeds, and the difficulty of dealing with it is due to the fact that it is practically impossible to prevent these microscopic organisms from entering stables and fields. The hon. member will find some interesting information on the subject in the annual report of the Director of the Veterinary Department for the year 1892.

August 28th.

PLEURO-PNEUMONIA.

Mr. W. WHITELAW asked the President of the Board of Agriculture whether, in view of the fact that pleuro-pneumonia had been introduced into Scotland by an Irish cow, he intended to put any restrictions on the movement of cattle from Ireland into Great Britain.

Mr. W. FIELD asked whether there had been an outbreak in Ireland since September, 1892, and as to which he had sent a copy of an official letter to the hon. member who put the question. It was very unfair to the cattle.

Mr. GARDNER: As to the question on the paper, there is no evidence that the animal in question contracted pleuro-pneumonia before leaving Ireland, and the morbid appearances of the lungs were, in fact, quite compatible with infection after her arrival in Scotland. With regard to the prohibition of movement from one part of the United Kingdom to another, I can only say that I should resort to such a step with the greatest reluctance and in the presence only of the most serious danger; but I may observe that if the policy suggested by the hon. member were adopted at the present time it would be movement from Scotland to England and *vice versâ*, rather than movement from Ireland to Great Britain, which would have to be prohibited.

Proceedings of Veterinary Medical Societies, etc.

SOUTHERN COUNTIES VETERINARY MEDICAL ASSOCIATION.

A MEETING of the Southern Counties Veterinary Medical Association was held at the Royal Hotel, Southampton, recently, under the chairmanship of the President (Mr. J. F. Simpson), and there were also present Prof. Penberthy, London; Messrs. C. Pack, Hon. Sec., Lymington; J. T. Burden, Beaulieu; J. B. Martin, Rochester; J. W. Barford, Southampton; C. Carter, Guildford; G. J. and J. F. Gould, Southampton; J. T. King, Bournemouth; H. Redford, Winchester; E. W. Baker, Wimborne. Messrs. H. Spurgin and G. B. Carnon, Southampton, were present as visitors.

The HON. SEC. announced that letters expressive of regret at inability to attend had been read from Sir Henry Simpson, London; and Messrs. Wragg, London; Edgar, Dartford; Goodall, Christchurch; Singleton, Ealing; and Prof. Pritchard, London.

A Ruptured Uterus—Dropsy.

The President said he had a specimen to exhibit which he thought might be interesting to them. The case had been introduced to his notice by his nephew at Windsor, and he had brought the animal with him. The subject was a black poodle bitch, which had been due to pup on the 7th June. She gave all the usual evidences of being in pup, and two days after her time was up appeared to the owner to be quite empty, but nothing in the way of pups was found in the place where she had been delivered. As the bitch was not making progress, and looked poor, and the abdomen was pendulous, professional assistance was called in. The case was diagnosed to be one of dropsy, and the opinion was given that the pups had been born and disposed of in some way. The spirits and appetite at the time were good, but the dropsy and emaciation increased. The case appeared to be one which was not likely to terminate successfully, and the owner consented to have the animal killed, which was done on the 13th July. The *post-mortem* examination was made the same night, when it was found that the uterus was ruptured, and that the pups had escaped into the abdominal cavity. A large amount of fluid, some three quarts, was found in the abdominal cavity. There appeared to be no evidence of septic peritonitis, and it was assumed that the irritation caused by the presence of those pups within the abdominal cavity, was the cause of the large secretion of dropsical fluid.

In reply to Mr. Martin, the President said he suggested that those pups got into the abdominal cavity at the time she should have delivered them in the ordinary way.

Mr. MARTIN asked how they got there.

The PRESIDENT replied that in the act of parturition, he should say the uterus became ruptured.

Professor PENBERTHY said he was very pleased to have the opportunity of seeing that specimen, and he was extremely grateful to the President for having given them the opportunity of doing so. He had seen all sorts of things in the abdominal cavity. The specimen in question emphasised in his mind ideas he had had for a long time, that the abdominal cavity was not such a dangerous place to get into if they could keep it antiseptic, and because the abdomen was ripped up they should never give up a case if they could support the organs inside with any fair chance of healing. He heard of the case of a man who, in an expedition, met with an accident by which a portion of his intestines came out. Well, they were simply pushed up, douched with the water of the river where the accident occurred, and that man lived after that. The wound he had was 27 inches long, yet the man lived for 27 weeks, and then died of some other accident.

Election of New Members.

Mr. HOBDAY was elected a member of the Association on the nomination of the Hon. Sec., seconded by Veterinary-Captain F. Raymond. Mr. H. Spurgin, of Southampton, was nominated a member of the Association on the proposition of Mr. J. W. Bartord, seconded by Mr. J. G. Gould.

ANÆMIA AND DIARRHŒA IN YOUNG ANIMALS.

BY PROFESSOR PENBERTHY.

Discussion.

The PRESIDENT remarked that those who were not present on the occasion of their last meeting missed a great treat, because Professor Penberthy gave them a most interesting lecture, and had opened their eyes to the fact that to the existence of those parasites, which he demonstrated with the aid of the microscope, was attributable a large amount of disease in cattle and in young animals. He (the President) felt sure that those of them who had the opportunity of reading the account of the meeting in the veterinary journals would have formed some idea, although a very imperfect one, of the great trouble Professor Penberthy had put himself to in order to make the meeting interesting. According to the reported account of that meeting, Mr. Barford proposed and Mr. Wragg seconded that the discussion should be adjourned, and that course was adopted. Had Mr. Barford been now present they should, of course, have paid him the compliment of asking him to open the adjourned discussion at the present meeting, but Mr. Barford was not there, and he (the President) had therefore to call on some other member who was present to do so. He was sorry the funds of their Society did not enable the Secretary and himself to have printed reports of the lecture circulated. He always thought that an excellent plan if the funds of the Society were available for that purpose, and it would be especially convenient in the present case, because so long a space of time had elapsed since the lecture was delivered, that it was a little difficult to call to mind every remark made by the lecturer. However, they must accept the situation and tax their memories in connection with the matter. He would ask Mr. Martin to open the discussion.

Mr. MARTIN said he thought it was very kind of the President to ask him suddenly to make an impromptu speech. However, he must say that he was exceedingly fortunate to be present at the last meeting to hear the professor, who delivered one of the most interesting, one of the most practical, and one of the most useful lectures he had ever heard. The subject was one which was fraught with the greatest possible interest to all of them, and this lecture placed them in a position to explain much as to the cause of diseases attributable to those parasites. They had, no doubt, been in the dark for a good many years, but Professor Penberthy had made a study of those worms which were the cause of diarrhœa in cattle, and which resulted in anæmia and death. In this period of agricultural depression, it behoved all of them to exert themselves as much as possible and to do as much as they could to save the position of their agriculturists. The matter was one of vast importance when they considered that in the autumn, and particularly in his district he had noticed it, they had such a great number of lambs dying. They thought it was from starvation, and they also used to think it was from keeping lambs out in the meadows in autumn time till they got so low that they could not recover; but now, through the efforts of their friend, he had shown them the cause of this anæmia among young animals, lambs, colts, calves, etc. What they wished him to explain to them that day was how the parasites came into the system. Were they taken up as ova, were they taken up in the food, and did they thus find habitation in the lungs or different parts of the system? Were they at first taken into the lungs as ova or young parasites? The losses to their

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farmers were extremely great, and he sympathised with them very much. After the farmers had been breeding stock—lambs he would refer to more particularly—until they had a choice breed they had taken great pains to produce, at the end of the season they were all dying. That was very disheartening, and some farmers said, "I think I shall give up breeding altogether, for every year something comes that destroys all our prospects." As veterinary surgeons, it behoved them to interest themselves in discovering the cause and throwing some light upon these diseases, and so assist the farmer. When they found some members coming long distances to support such meetings as the one at which they were now assembled, and doing the best they could to advance the interests of the veterinary profession, and when they found Professor Penberthy exerting himself to give the lecture, he thought it was very discouraging for those who took such trouble to find that they got so little support from men in the district in which they met, and that they did not take the trouble even to attend. Passing from this matter and referring to disease in cattle, he asked how were they to cure it? How were they to stop it? What advice could they give to their agriculturists in preventing this disease and in curing it when it did come? If they only gave one dose of a certain character, he thought they would ward that off. As far as his knowledge of the treatment of those young stock went there had been lately introduced a system of injecting drugs into the trachea. He did not think it was very reliable, because the parasites bred so fast that the whole system became inundated with them, and, therefore, they need saturate the system with such medicines as would kill those parasites and not the animals themselves. What he found successful was turpentine. A great many farmers gave turpentine and milk and some gave oil. He did not think oil was a good thing, and it was too expensive. He gave turpentine, carbolic acid and iron, but to get those to mix they must get an alkali. He put soft soap and carbonate of ammonia, and with one or two doses a cure was effected. Where the disease had been long in existence—some farmers would leave thé matter a long time before they applied to veterinary surgeons—then they got organic changes, more particularly in the lungs, and then, of course, medicines were of very little value.

The CHAIRMAN remarked that Mr. Martin, he took it, was referring to lung parasites.

Mr. MARTIN replied that he was speaking as to parasites all over the system. That was why he held that injection in the trachea was unreliable, because they would find them in the intestines, in the mesentery, and in other parts of the body. He thought if the members attended their meetings and gave them the result of their practical experience, they could convey and impart information to each other which would have a beneficial result. He had had great experience in this matter, and he had taken a great deal of pains to get turpentine and water mixed. They could not have oil. By boiling it with the alkali they got a chemical mixture, but unless they got that they could not administer it.

The CHAIRMAN said he would remind gentlemen that Professor Penberthy's lecture only had reference to those parasites which infested the stomachs and the intestines, causing this anæmia and diarrhœa.

Mr. CARTER remarked that in his experience in the treatment of lambs, calves or colts, he found nothing to beat turpentine and oil. For calves and even sheep, in the bronchial tubes he had always used fumigation with the best results.

Mr. MARTIN: With chlorine.

Mr. CARTER replied in the affirmative. Proceeding, he remarked that it was just the same with dogs. A little while ago a lady came into their surgery with a dog. She said it was very ill. His son happened to give it a

little medicine at the time and she said it vomited a tape worm, he should think about 18 ft. or 19 ft. long, but with lambs and with calves, for bronchial affections, he held firmly to fumigation. He had tried injection into the trachea but he never could succeed with it. Mr. Carter then referred to a post-mortem held on the carcase of a horse out of which he said he took, he should think, three pecks of ascarides. The animal was healthy, and that showed to him that those worms did not do horses much harm. They had had them in pigs the same. It was very unusual to find a fat pig that had not got some worms. He regretted that he was not present at the last meeting of the Association.

Mr. PACK said he was one of those who were fortunate enough to be present at their last meeting, and what struck him at the time Professor Penberthy gave his lecture was the similarity in the symptoms to those of tuberculosis in cattle, especially the diarrhœa and wasting. Since the lecture he had been looking into these cases and had selected two for the treatment advised by the Professor, one animal being a young bull and the other a heifer. At the end of a week he learned the bull had died and been buried for three days; the heifer recovered. As no post-mortem of the bull was made he could not say the cause of death was helminthiasis. He believed that in the treatment of all the diseases caused by parasites, the great thing to be aimed at was to support the system with nutritive food, to help the medicine administered. He had been treating a filly for strongylus tetracanthus, but the difficulty was to get her to eat enough to sustain her. At last she was allowed plenty of milk which she took readily, and he was pleased to say that from a bag of bones she had now become fat and round. He had the opportunity of making a post-mortem of another animal which had died from disease caused by the tetracanthus, and the post-mortem appearances were something to be remembered. The mesenteric glands were even suppurating, with strongylus existing in their structure. With regard to the treatment of hoose in calves he thought he had tried almost every treatment with varying success, and he had come to the conclusion that as far as cure was concerned it depended on the stage in which treatment was commenced. He must say, however, that latterly when other means appeared to fail he had capital results follow the pouring of turpentine up the nostril. That had succeeded after injecting the trachea had failed. He could not explain the difference in the two methods, but such was the result. In other cases he had found intra-tracheal injection answer admirably, also fumigation.

Mr. BAKER said he could assure them it was a cause of great sorrow to him that he was unable to be present at the lecture delivered by his old friend and fellow-student, Professor Penberthy. He could bear testimony to the great interest the Professor had taken in the matter before the meeting, and to his kindly assistance to himself whenever he had applied to him for it. The Professor had always been most ready and most prompt to afford any assistance whenever he had had the opportunity of calling upon him for it. At the same time he thought they must not be too strong in their censures upon those fellow-members of the profession in the neighbourhood who had been unable to be present that afternoon. They must rather put charitable construction upon their absence, he took it. He felt that their non-attendance was not out of any want of respect to the President or the Professor, or want of interest in the welfare of the profession, but, like himself, he presumed they had calls upon their time to which they felt bound to attend before those meetings, necessary as they were. Relative to those nematodes they constituted a subject of great interest to him. He thought most of them had found an early administration of an oleaginous drench benefited the system and prepared it for the administration of other medicaments afterwards. He had always believed that turpentine and linseed oil, combined with a certain

proportion of carbolic acid and sometimes assafœtida, the best form of treatment he could adopt. And, as suggested by Mr. Martin, he found no better agent to build up the system than iron, not necessarily given at the time the oil and turpentine was administered but for continued treatment afterwards.

Mr. BARFORD remarked that he had not very much to say, but if they would allow him he desired first to apologise for the absence of his father, who was unfortunately indisposed and was now under the doctor's care, and consequently not able to attend the meeting that day. He knew his father very much regretted being unable to be present. Proceeding, he remarked that he had not the pleasure to be present when Professor Penberthy gave his lecture which he very much regretted, as he hoped to learn something from the lecture. He must rather agree with Mr. Carter's experience that he had had more success from fumigation with chlorine than anything else, especially with lambs and calves, and he happened to prove it from *post-mortem* in the cases he had had to treat. He might say he should like to have the formula of the mixture Mr. Martin had spoken of. They did not get a lot of cattle treatment in their practice, so that he had not been able to do so much under those circumstances as other practitioners, but he had learnt one or two "wrinkles" he thought that day. Passing from this subject he remarked that they were very much grieved to find such a very sparse attendance at that meeting. It seemed they could not get people to come to Southampton at all, and if their Southern Counties depended upon Southampton to hold their own they would, he was afraid, collapse. They ought to combine more than they did. He did not think they consulted one another enough. He thought they ought to be a little more communicative amongst themselves. They seemed afraid to talk to one another. He hoped if ever the Association came to Southampton again they would have a better meeting than the one of that day.

Mr. G. J. GOULD said that in his experience in dealing with worms in the bronchial tubes, fumigation was the right treatment. They got great losses there in calves.

The PRESIDENT observed that they had, he feared, rather strayed from the subject before them for discussion, as they had gone into the question of those parasites which infested the bronchial tubes of the domesticated animals. The subject of Professor Penberthy's lecture was anæmia and diarrhœa in cattle, more particularly young cattle, caused by the presence of certain parasites which he enumerated, and he (the President) thought that in the remainder of the discussion it would be advisable if they confined it to that subject. As the subject of fumigation had been introduced, he might say that undoubtedly in his experience it was good practice, but to his mind too much importance was attached to the consideration of the agent which would kill the parasite. He had no hesitation in saying that they did not kill the parasites by whatever agent they might employ for the purpose of dislodging them, but simply set up an irritation in the mucous membrane which caused a large amount of secretion, causing coughing, and the parasites were dislodged in that way alone. They were coughed up into the throat and taken down into the stomach where they were harmless. Any agent which would set up irritation in the bronchial tubes was a good agent to use for the dislodgement of those parasites. He was sorry no one had touched upon the question raised by Mr. Martin in the early part of his remarks, as to how those parasites obtained an entrance into the intestines. Mr. Martin asked whether they entered as young parasites or in ova form. He should be disappointed if Professor Penberthy did not share the view he entertained that they entered unquestionably in the ova form. With regard to the prevention of anæmia and diarrhœa as resulting from the presence of those parasites, he thought with Mr. Martin that that was a most important question

for them as veterinary surgeons to take into consideration. Having once satisfied themselves that animals were the subjects of those parasites, no stone should be left unturned to enable them to prevent other animals from being affected in a similar way. If he remembered rightly, Professor Penberthy advocated the free administration of salt, and other agents. With regard to the treatment, they must at all times bear in mind that those parasites were blood-suckers. They really lived upon the blood which existed in the intestines, and when they considered the enormous number—thousands, he might say millions—which existed in the colt's intestines sometimes, they could understand the enormous amount of blood consumed by those parasites. The fact that emaciation and diarrhœa were invariably associated with the presence of those parasites was proof of the enormous amount of blood which they consumed. Possibly there were very few who had not had the opportunity of examining the mucous membrane of a colt which had been affected by and died from those parasites, but should there be any veterinary surgeon who had not examined it he commended it to him as a subject for consideration. When first he saw it, he confessed he looked upon it with a very great amount of astonishment and surprise. He thought there were many cases in which the diseases for which they treated received the name of chronic diarrhœa. He felt sure that simple diarrhœa was to be treated and treated successfully. Of course, diarrhœa might arise from many causes, one of which, as Mr. Pack had pointed out, was from tuberculosis of the intestines. For such a form, he said, there was no cure, but for the diarrhœa which might arise from the existence of those parasites he thought, if they were not too late in attacking them, there was a cure. He had the opportunity one memorable occasion of consulting Professor Penberthy in a case where those parasites existed in a colt. He gave the opinion not only that the colt in question was affected with those parasites, but he also expressed the opinion that another animal, which was showing no signs of wasting, was the subject of those parasites. In this instance his opinion was questioned, and he knew of no better authority to whom he could apply to examine and report upon this case with accuracy than their friend, Professor Penberthy. He appealed to him and the Professor made his examination and, he was glad to say, he confirmed the opinion already given. They both agreed—the case had only been under his observation for two days—that it was a hopeless case, and he found that within a few hours after Professor Penberthy and himself reached their homes the animal died. They made a *post-mortem* examination and it bore out the opinion formed during life. As to the treatment he would advocate generally for cases of this kind, he was decidedly an advocate of the administration of iron. He believed there was nothing like it in those cases. Unquestionably it did kill the parasites, and the double advantage of using iron was that they actually killed their parasite and the iron acted as a perfect tonic. Unless the system of animals so affected was kept up, and thoroughly well kept up, they might depend upon it they would slip through their fingers as quickly as rotten sheep.

Mr. BAKER would like to ask the Professor if ever in his experience he had found the presence of nematodes in dogs being communicated to horses with detrimental results, because in his practice he had reason to suspect it, but had never been able to prove it.

Professor PENBERTHY, who was cordially received, said that he had willingly consented to show a few specimens of a nematode worm which in his experience and all the literature at his disposal was absolutely new, and this worm had not before been introduced. He was led to think from his own experience that those parasites were the chief factors in bringing about that diarrhœa which he tried to describe in his previous remarks on this question. As the subject had not been much spoken of and investigated, he

was extremely glad the remarks had really dropped on to other matters, because from each other's experiences they were sure to learn something. Mr. Martin gave fumigation another trial, and it seemed they were all willing to give Mr. Martin's recipe a trial. In the drugs they had mentioned that day there had been no new one referred to, they were the drugs which had been used for the last 200 years, and consult what books they liked they would see it, and they applied them constantly. It was the outcome of practical experience of clinical observers that had maintained those drugs in their beneficial use: and he maintained that to the careful clinical observation they owed much more than to the results of scientific investigation. They did not want to desert clinical observation for the more minute process of pathological research. He said not a word against those means of research. He would do everything he possibly could to stimulate them, but he certainly thought they should not desert their own observations of which they were every one capable. Assafœtida was an old drug which had been mentioned. It was one of the finest anti-spasmodics they had, and it had the great advantage of doing no harm. One very important aspect for veterinary surgeons was the manner in which the animals were attacked. Here pathological research came in. He looked upon those parasites as newly discovered, and he had an idea that they were swallowed as ova, and became matured in the intestines. They found the females crammed with eggs as they saw at Red Lion Square, he also found intermediary stages of the parasite—not fully matured. That gave him the idea that they were taken in as eggs. They developed in the intestines and laid eggs there, and he saw no reason why the eggs inside should not develop and keep up that constant source of anæmia that they saw. Regarding treatment, if they got rid of the worms, they would not have recovery unless they continued the use of salts and iron. He proceeded to refer to a number of animals that had been affected with the disease, some of which seemed better than the others. In those cases the salts and iron were not continued, and they died; whilst the animals which had been the worst, but had the continued use of salts and iron, recovered. There was an alteration in the corpuscles which could not be recovered unless with the continuance of the salt and iron. White scour in calves, referred to by Mr. Gould, was of course another thing altogether. That was due, in all probability, to a microbe, not a worm at all, but a vegetable microbe, and that must be treated as a contagious disease. As regarded Mr. Baker's question, he could only say he had never been able to discover any connection between nematodes of the horse and dog. That, of course, might be from want of knowledge of life history of the different parasites. He could not call to mind at that moment any single nematode which existed in the dog that was known to exist in the horse in an immature or mature form. He thought half way with Mr. Carter, that the nematodes did not do the harm in the horse that they did in the pig. They were a cause of epilepsy in pigs, and he looked upon them as dangerous.

The PRESIDENT said he had to ask them to thank Professor Penberthy. He felt obliged to him and deeply indebted to him for the trouble of coming there that day. However much they might have argued amongst themselves in regard to the subject for discussion, with the knowledge that the Professor would be present they had felt that they should hear something which would add to their knowledge on the matter, and he would propose a hearty vote of thanks to Professor Penberthy.

Mr. BARFORD seconded the motion with very great pleasure. Although he had not been present when Professor Penberthy gave his lecture, he had learnt a great deal from the Professor's remarks.

The motion having been adopted.

The PROFESSOR, in returning thanks, said that if they put aside the cir-

cumstances of any interesting cases coming under their notice and made notes upon them and laid them before the Society, they would not be devoid of interest. If there was anything he could do to help that Society at any time, it would be a great pleasure for him to do it.

It was decided to hold the September meeting of the Association in London.

On the motion of Mr. MARTIN, seconded by Mr. G. T. GOULD, a vote of thanks was accorded the President, and the meeting terminated.

THE CENTRAL VETERINARY MEDICAL SOCIETY.

THE usual monthly meeting was held on June 1st, at the Holborn Restaurant, instead of the Royal College of Veterinary Surgeons, Red Lion Square. Mr. W. Roots, President, occupied the chair, and the other fellows present were :—Fellows : W. F. Barrett, T. Burrell, R. Butler, T. C. Garry, A. E. Gostling, Wm. Hunting, J. S. Hurndall, F. W. Kendal, G. C. Lowe, Prof. Macqueen, Prof. Penberthy, Wm. Pritchard, A. Prudames, Captain Raymond, H. G. Rogers, W. Roots, J. Rowe, F. Samson, Prof. E. S. Shave, Wm. Willis, F. W. Wragg. Visitors : A. E. Clark, G. J. Conford, Morgan Evans, D. C. Houston, M. A. Hutchener, J. A. Lipscombe.

Mr. Freer of Uppingham and Mr. Hutchence were nominated as Fellows.

The following paper was read by Mr. J. S. Hurndall, M.R.C.V.S., on

"THE IMPORTANCE AND VALUE OF SYMPTOMATOLOGY IN DAILY PRACTICE."

Mr. President and Gentlemen—When our esteemed secretary honoured me with a complimentary request to prepare and read a paper before this Society, I must confess to having experienced feelings akin to a very decided diffidence to undertake so responsible a duty, and upon reflection I feel that I shall not be chargeable with false modesty in making such an admission, when it is borne in mind that the Central Veterinary Medical Society includes in its Fellowship, and very regular attendance, a number of gentlemen who by reason of their general learning and their powers in debate have helped to raise this Society to the highest pinnacle of fame among similar institutions in Great Britain ; it would be invidious to mention names, but we have only to cast the mental eye down the roll of names of those who not only pay their annual subscription for Fellowship, but who more often than not grace these meetings with their presence, and we cannot but be impressed with the idea that he who ventures to furnish material for discussion at these monthly re-unions, unless he is to appear ridiculous in the eyes of others, if not his own, must be prepared to select a useful subject, and moreover should be in a position to substantiate his views, for in all probability when the time for discussion arrives it may be subjected to the keenest criticism and for awhile he may have a rather rough time of it. There are, as you all know, a number of societies similar to our own in this country, which can furnish a membership roll including the names of those who rank very high in our profession, but if you were allowed a casual glimpse at their minute books, you would discover that these gentlemen of high estate in the profession are notable chiefly by their absence from these meetings. Of course it is not their fault, because the greater number live at such a distance from the places of meeting of said societies that, except under very exceptional circumstances, it would be hardly reasonable to expect these gentlemen of the professional blue blood to attend. How differently we are situated with "The Central." It is the marvellous good fortune of this Society to hold its meetings—and they are more frequent than those of any similar society—in a locality that

suits the convenience of some of those who may be styled the *creme de la crême* of the veterinary profession, judging them from the standpoint of scientific attainments; whose attendance is remarkable for its regularity. Anyone who thinks he can bring a paper before this Society without having it mercilessly threshed out will, after making the attempt, discover his error—and that possibly at the cost of some personal pride. Bearing in mind, then, that I undertook the fulfilment of what I am told is one of the duties devolving upon me as a fellow of this Society, in fear and trembling, the next difficulty I had to face, was to select a subject, and to discover this I began to ask myself the following question: What, from your own experience, is about the most difficult thing that members of the veterinary profession have to grapple with? I commenced to take in review the subjects upon which had been expended the largest share of attention on the part of the leading spirits of the profession; and after a very critical, at the same time I hope impartial, examination of the matter, so far as information could be obtained from professional journals, periodicals and literature generally, I came to the conclusion that for a number of years past, the best energies of the very *élite* of the veterinary profession on the Continent, in England, and the United States of America have been devoted first to the elucidation of *pathology*, and second, to what for lack of a more comprehensive term I must apply the hackneyed, but very incorrect term, *preventive medicine*.

Now, while I have in all good faith looked up this subject, and satisfied myself from immediate personal examination of the veterinary and medical literature of the day, as to the direction into which the scientific savants of the last and present decades have devoted their energies, I do not wish you to arrive at the conclusion that I have made a recent discovery, or that when I tell you I think they might have made a much better use of their time I have formed the opinion a short time back. Not at all! My opinions hereupon may be said to date back to a period long antecedent to my entry into the veterinary profession. No doubt to some, such an assertion will sound awfully bold and heterodox, still it is true—and I may add that the valuable knowledge I obtained through my studies when preparing for the several examinations to obtain a qualifying diploma, together with experience gained in daily practice ever since, have served to confirm me in this belief. But I have to bear in mind that I am addressing a body of gentlemen, who are in all probability able to judge better, and without doubt as well as I, who seem perfectly contented to take for granted what the big men of the profession tell them about the advantages—"the pre-eminent advantages"—of a study of pathology, and the relation which the various known micro-organisms have to disease in its many-sided phases, and I trust you will accept my assurance that I have no intention of giving offence when I state that the marvellous credulity of both the veterinary and the medical profession, so far as regards these subjects, is altogether beyond my feeble comprehension. I have no desire to make an attempt at turning to ridicule the laborious efforts of men of high scientific attainments. It would unquestionably be not only presumptuous, but an offensive mode of procedure on my part; at the same time I cannot but feel and express the most profound wonder that men capable of such earnest hard work have not in greater numbers seen the futility of their efforts, confined as they have been to these two branches of study and research. I do not wish you to understand that I undervalue the importance of the study of pathology and bacteriology. In conjunction with the study of therapeutics these two branches of scientific research are invaluable, but alone they are little better than valueless so far as the healing art is concerned.

Having assured myself as to the direction into which the men of light and leading in the veterinary and medical professions had for some time been

devoting their energies, I began to ask myself: What has been the result of all this expenditure of time, money and life? I began to enquire whether there was any real practical outcome from it? Had any satisfactory discoveries been made to assist the hard-working practitioner in curing cases as they came under his notice? Had any law been discovered to assist one in determining what was the condition of this or that patient when called in by a client; or to enable a veterinary surgeon to determine with precision and certainty what drugs to prescribe under given conditions? In short could it be said that after all the lavish expenditure of money and time, and the sacrificial offerings of frogs, rabbits, mice, dogs, etc., innumerable, any really substantial benefit accrued either to the human or lower order of animal kingdoms, with a view to the cure of disease? I have been able to discover none; on the contrary I find that gentlemen of note in the scientific world, such as Pasteur, Koch, Klein and many many others of more or less repute, who have at various times created tremendous sensations not only in the scientific world, but among laymen also, to wit the notable fiasco at the Mansion House under the then Lord Mayor of London, anent Pasteur's anti-rabic discovery. Under cover of the credit and repute of scientific discovery, there never was a greater fallacy attended as this was and, is still, with such fearfully serious results for the human subject. These gentlemen can none of them show that they have, by one iota, advanced the practical application of drugs to the cure or alleviation of disease; these are, I readily admit, very bold statements to make in face of the many remarkable and startling announcements that have from time to time been presented to the world, but although it is commonly affirmed that figures can be made to prove anything, there is no difficulty in furnishing statistics that will prove, up to the hilt, all that I have taken upon myself to aver. What is the chief function of the veterinary surgeon and the medical practitioner, that is to say in the opinion of the general public, and particularly that portion thereof which pays for professional advice? Is it not that someone who owns a horse or some other member of the lower order of animal creation that is suffering calls in a responsible member of our profession and commits the animal to his charge with a view to speedy restoration to health; again men and women present themselves before the medical man, a fee is paid, and a full explanation given as to sensations and symptoms subjective, and he or she goes away in the full hope that money has been paid for advice that is, as soon as may be, to result in restoration to health and strength. Is this not so?

You may tell your clients, and so may medical practitioners, that the best efforts of the cleverest men of the day have been directed to the consideration of the most intricate subjects connected with disease in order to determine its origin and special characteristics, and that it is hoped as a result of such investigation that means will be discovered how best to counteract the same; or you may endeavour to explain that such and such a micro-organism has been discovered, whereupon experiments have been made to determine whether or not some measures can be adopted in order to protect animals and persons from the invasion of such and such disease, and with what reply are you likely to be met? Probably somewhat as follows: *"Your experiments and your learned disquisitions on the origin and cause of disease are all very well, but can you cure my animal or can you restore me to health?"*

I submit to you, gentlemen, that in far too many instances to be either pleasant or creditable to the learned professions of medicine, both veterinary and medical, the reply you would be obliged to make, if it is to be a conscientious reply, would be anything but satisfactory. I propose to read a few extracts, bearing upon this subject, culled from the opinions of leading men in both branches of the profession, and to commence with I will take an extract, presumably from the pen of our learned *confrère* Professor

MacFadyean which appeared in *The Journal of Comparative Pathology and Therapeutics* for December, 1892, vol. v., part iv., "A marvellous addition to our knowledge of the pathology of many diseases has been made within the last twenty years, but it can hardly be said that equal progress has been made in the direction of therapeutics. To say this is in no way to reproach those who have specially devoted themselves to the discovery of new medicinal agents. It lies in the very nature of things, that it may be much more difficult to discover a remedy for a diseased condition than to discover the cause of it, although the discovery of the latter must in general be of great service in pointing the direction in which to look for a remedy. It is chiefly with regard to the important group of bacterial diseases that pathology has outstripped therapeutics. Since the cause and exact nature of many diseases of this class have been searched out, it has become evident that many of the agents formerly regarded as curative are valueless; and at the present time we are bound to confess that while we know a great deal more than was known twenty years ago about the means of prevention, there are many diseases for which no medicinal remedy is known." This is a delightfully positive statement from beginning to end; had the writer only possessed the modesty to add the following words, "*so far as I and those who belong to the same school of thought know*," it would have been a little more gracious on his part.

Again to take an illustration from the medicos, in *The Lancet* of the 14th November, 1885, is published an address delivered at Birmingham by Dr. Wilks then one of the consulting physicians to Guy's Hospital, on "The Treatment of Disease." In the course of the address Dr. Wilks says, "After considering these primary and important functions of the medical man, we eventually come to treatment by means of drugs and other agents. Now this method arose no doubt in superstition. If any part of the body was in pain it was to be relieved by rubbing or applying something to it, something especially which could be felt like heat or cold, and at the same time a liquid was put into the mouth. We see the process repeated every day in the streets; if a poor man falls in a fit or from faintness, he is pulled up on his legs, or set up, shaken, rubbed, and various things, especially spirits, are forced between his lips. I feel some sympathy with these well-wishers, for everyone of us must constantly find himself in a similar position and rather sorry plight when called to a house to witness a patient die of apoplexy and the wife and daughters beseech us to do something to save his life. To get rid of their importunity and to occupy them we set them all to work to make mustard poultices and such trifles. Old books on medicine or herbals will show how every known plant was dragged into the service of the materia medica, and very often a very large number of them were combined together for medicinal use. There is no account ever given to show that their value depended on strict observation, but it is rather too evident that they were administered for the most fanciful reasons as the colour of the flower, the shape of the leaf or fruit. It required the era of Bacon to discard all these fancies and bring into force the method of observation and experiment. It would be interesting to know at the present time how many medicines are given from a knowledge of their use, and how many because we consider them likely to do good by simply following the dictates of our minds. I mean where, for example, all of us, without exception as far as I know, write down on a piece of paper measuring six inches by four, some drug for every trouble which the patient presents himself with, it would be rather difficult for us to give always a good reason for our action. I think it is not difficult to see that our art had not a scientific basis, but on the contrary was like all other arts of ancient times, formed out of the fancies of the human mind."

I could continue to quote from this address equally damnatory admissions

of helpless incapacity, but the foregoing surely suffices, and time will not allow, but I ask, did you ever hear of or read a more pitiable confession of absolute lack of ability to perform some of the simplest duties for which professional medical men are every day paid handsome fees, than Dr. Wilks here acknowledges. I could quote from the opinions of such men as Dr. Bucknill, Dr. Whitle, of Belfast, Dr. Gairdeur, professor of the practice of medicines in the University of Glasgow, and others, who have on occasions given vent to similar desponding views as to the utility of medicine, and who seem to hold the opinion that a knowledge of the action of drugs is "vague and imperfect." I have thus endeavoured to show you from the publicly avowed opinions of two of the most prominent professional men of the day, and, as I have already said, if time would allow, I could find very much more of the same sort of material, that therapeutics or the healing art have not been advanced by the immense amount of work that has been involved in the elucidation of pathology, or the discoveries made in bacteriology, and I have no doubt that were you inclined individually to give your opinions on this subject, you would one and all—though probably with some reluctance—be compelled to admit the truth of my assertion.

I ask myself this question, viz., if all that has been done by some of the cleverest men of the day in the regions of investigation into pathology and bacteriology has not resulted in enabling me to solve the all-important question how to prescribe for and cure disease with certainty, safety and celerity, is there any other course open to me? I satisfied myself that there is, and under the title of symptomatology, I propose to offer you a few thoughts, based not merely upon theory, but upon really practical evidence; evidence obtained not simply in my own experience, but in that of thousands of honest, earnest workers over a period of something like a century; workers as learned, as persevering, as industrious and as competent as the most eminent pathologists or bacteriologists of this or any other day. Now, in the first place, this study of symptomatology is suggested to enable you to prescribe with precision for patients which are the subjects of some disease. There is, at least, one gentleman in the room, probably more, that will not allow that medicine is an exact science; I don't agree with him. Given certain conditions, which I admit are very difficult to arrive at, in consequence of the variety of forms that the diseases assume in different subjects, which, of course, depend in no slight degree upon the peculiar idiosyncrasies of the individual subject; still, given those conditions, I am firmly convinced that in practice of medicine, we have at our disposal as exact a science as any you can name, physical, chemical, astronomical, or what not? I am convinced that the law laid down by Hahnemann, more than one hundred years ago, of which Hippocrates himself had a mental glimpse, is an absolute law in medicine. That such is the case, I know full well you decline to admit. But you must pardon me when I assert that the doubts you entertain are due to the fact that you have only given a very superficial consideration to the subject; the difficulties which are obstacles to your acceptance of the law, so readily present themselves, and probably appear to you so glaringly foolish, that you deem the subject hardly worth a moment's thought; indeed, the only wonder in your minds is that any man of ordinary common-sense can be found, who, after the barest examination of its merits, is willing to devote time and energy to the discussion of the principle. In addition, there is that exceedingly powerful and influential factor in the discussion of this subject, that it is unfashionable—unpopular with the leaders of the profession and the faculty, for it to be known that even with the bare skirts of your garments you have touched the unclean, the unholy thing. Away with such weak and frivolous excuses! I say, you are professedly the healers of sick animals; do you intend to shut your eyes to truth because, forsooth, your teachers, like the Levite of scrip-

tural history, pass by on the other side? I ask you to do, as many have done already, make a study of the principle. Don't allow shallow objections, which, being the lightest, always come to the top first, cause you to close your eyes to the truth of a law which, I believe to be, like all laws of nature, a divinely-inspired one. There are some Fellows of this society who don't believe in Divine inspiration; but inasmuch as they are in a very decided minority, I take leave, without wishing to offend their sensibilities, to assume that there is such a fact as Divine inspiration, and to refer to its existence, because I am satisfied the majority of those who will listen to this paper, believe in the existence of such a power. Whatever our faith may be on this part of the subject, whether we think the laws of nature are divinely ordained or not, there is the fact staring us in the face that in physics, chemistry, astronomy, and other branches of science, there are fixed laws, and why not in medicine? Can any rational objection be advanced against the latter, and, if not, why refrain from giving the matter a thorough sifting and examination? I may tell you that if you have the courage and the pluck to embark upon this sea of investigation, you must expect to encounter many a rough storm of doubt before you are likely to arrive at the haven of decision; but if you undertake the voyage of investigation with an honest determination to reach the port of truth, you will, notwithstanding the many points on the chart marked dangerous, ultimately reach a haven of therapeutic rest that will prove truly acceptable to you after the many tempest-tossed experiences of doubt that you are now going through.

As the existence of this therapeutic law is closely allied with the subject of my paper—indeed, I may say that for its realisation it depends upon a knowledge and very fine appreciation of symptomatology—it is desirable, before I attempt to elucidate and define the place of symptoms in relation to drug selection, that I should first examine the methods and principles upon which the dominant school of medicine relies in clinical practice. This is all the more necessary, lest from what I have already stated I might be misunderstood in relation to my estimate of pathology. It might be thought that I attach no value to this science; such, however, is not the case. I consider pathology a very important subject to assist, mark you, not to rely upon entirely, nor even mainly, in selecting drugs for the cure of disease. I consider the dominant school, in which I take the liberty to include most of those present here to-night, rely too exclusively upon pathology in the application of the science of therapeutics; and hence I have no hesitation in saying, arise the many disappointments in practice.

The prevailing method of treating disease by members of the dominant school of medicines "involves a theory of the cause and essential nature of the disease, and the resort to some expedient which would be likely to remove this supposed cause of the disease, and to bring about a contrary state, and so conduce to health. (Dunham.) This is commonly described as the rational process. The other process which Hahnemann perceived to be comprised in the prevailing methods of treatment was—administering in the case of a very few diseases, of which fever from marsh miasma may be taken as the most illustrious example, certain remedies which had been discovered to possess, in some unexplained way, a power to cure these diseases. Such remedies had been discovered by the merest accident. No method was known by which others could be discovered; no method had been suggested by which it could be more clearly ascertained and defined for what particular varieties of the diseases in question the specifics, as they are called, were especially appropriate." (Dunham.) Now I take it, gentlemen, that you will all allow that, according to the principles upon which you work, your science of therapeutics is based "in its general principles and in its special applications upon the science and the facts of pathology."

Let us clearly understand each other as to what is meant by pathology; and we cannot do better than accept the definition of the word from so high an authority as Dr. Carpenter. By him it is declared "to be the science of the phenomena of disease or abnormal life;" you will perceive that this science must be kept quite distinct from pathological anatomy, which treats of modifications of substance or structure of various tissues and organs of the body which are due to the ravages of disease, but which can be studied either upon the living or dead body.

Now as pathology is the science which treats of disordered functions in the living body, it becomes quite clear that a very large proportion of the opinions formed as to the cause and origin of disease must of necessity be of a speculative and theoretical character, nothing positively certain about them. How, then, can the science of pathology serve as a groundwork or basis upon which to establish a foundation for the practice of the science of therapeutics?

I would put it to you whether you have not found that "the attempts to bring pathological doctrines to bear upon the treatment of disease," have not more often than not resulted in failure and disappointment. I fully believe that pathology is capable of assisting us in forming a diagnosis, and not infrequently a prognosis, in cases of serious malady, and for these reasons only the science is unquestionably very valuable both to ourselves and our clients; but as a therapeutic guide, the experience of all time from Hippocrates onwards has proved that it is but a broken reed to trust to in prescribing. Again, if there were no other guide than pathology to assist one in determining what drugs to prescribe in disease, it become absolutely necessary to wait for developments; indeed, it is quite an everyday occurrence to hear of fashionable physicians and popular veterinary surgeons having informed their patients and clients that they required more time and better acquaintance with the case under consideration before they could speak with any degree of confidence as to the nature of the malady, and consequently before they could prescribe to their own satisfaction; meanwhile the patient has to do the best he, she, or it can. What is it that causes the patient to become aware that something is wrong, and either to speak of it or show it by signs of distress? something that is to lead up ultimately to a pathological development which is to enable the physician or veterinary surgeon to speak positively as to the nature and cause of the ailment? Why, nothing more and nothing less than symptoms. Does it not strike you that if you have to wait for the mysterious developments of pathology in order that you may determine the exact nature and the remote cause of disease before you can even commence to treat a case, that you are exposing your patient to considerable risk and danger? And does it not also strike you that, when all the marvellous provisions in other branches of science affecting the law and order of nature are taken into consideration and found to be so redundantly provided for, the very science of all others which is presumed to affect, if not control, the life of man and animals, each of which in its relative position is assumed to occupy the higher *rôle* in creation, should be consigned to the tender mercies of a science which under the most favourable conditions can only be relied upon as a highly speculative and theoretical one; determinable only when the speculations and theories of its devotees can be positively established and proved *post-mortem?*

Pathology, I am well aware, helps to determine abnormal conditions which can be recognised. With the stethoscope, the laryngoscope, and such like instruments, and by the aid of chemistry, a practitioner can form definite opinions upon the state of the secretions and excretion and similar abnormal conditions; but in each case these abnormal conditions are not the disease, but the result of disease; and I, for one, cannot accept a science which has to wait for such developments as these before it intimates to me what I am to do to cure my patients, as the science which is to be my therapeutic guide.

Indeed, if I had no better and more satisfactory basis of drug selection to rely upon than that furnished solely through pathology, I should consider it altogether unworthy the definition of a science.

I am not at all surprised when I hear my professional brethren say that medicine is not an exact science, when I find them relying upon pathology as their therapeutic guide; nor can it be wondered at that thoughtful practitioners should discover that hardly two of our numbers can be found to agree upon any given subject connected with practice either in pathology or therapeutics. Theories regarding the nature of morbid conditions are so varied and so frequently modified; at one time a special theory is all the rage, at another it is obsolete; how, therefore, can you, with any show of reason, expect to glean from such a science reliable suggestions for the cure of disease? The phenomena of disease which constitute the science of pathology are exceedingly inconstant, inasmuch as in different individuals or animals they are modified in type according to the peculiar constitutional and diathetic conditions of the patient, and although names are pathologically applied with a view to the classification of diseases, you must have all found in practice that such names are more or less imperfect in their exact application, and proportionately misleading when you come to determine the line of treatment to proceed upon. To illustrate my meaning still further, allow me to remind you of that troublesome disorder known in common parlance as "parturient apoplexy;" how many theories have been advanced as to the pathology of this disease? I take it that not one in this meeting could answer the query; personally, I would not undertake the task to calculate, but we shall all, probably, agree that they are very many; and after all that has been spoken and written upon the subject, is there any really practical outcome towards the solution of the all-important question, how to prescribe for the disease upon a pathological basis? Cures undoubtedly are made, and some practitioners are more successful—or lucky than others; but can anyone of these gentlemen assign a rational sequence, on pathological grounds, for the cure he claims to have made? I have no hesitation in openly affirming that not one of them can do so, simply because the pathology of the disease has never been settled, therefore they cannot claim these cures as a successful exhibition of their own method of treatment by means of pathology.

Again, take *Rheumatism*. We will admit, for the sake of argument, that the pathology of the disease is understood. Are the phenomena constant, and does the line of treatment adopted by the dominant school of medicine, as suggested by an acquaintance with the pathology of the disease, show satisfactory results? There is but one answer—a plain, unvarnished, No!

Once more, consider what a variety of conditions are covered under the one term *Neuralgia*? In the nomenclature of pathology this term stands out alone, and if the pathological basis of drug selection be the true one, then one line of treatment should succeed in every case. But does it? Is it not rather the exception than the rule to find the treatment of the dominant school affecting any good at all in that disease which vaguely signifies *nerve pain*? Almost every case has its peculiar features as regards both the character and the periodicity of the pain—to say nothing of the locality and the various causes, each of which depends in a very large degree upon the concomitant symptoms attending it, the remedy for which cannot rationally be determined on a pathological basis.

These illustrations furnish a description of not merely the difficulty, but the absolute impossibility of treating disease from an acquaintance with pathological phenomena alone; and the daily experience of the school which claims for itself the vaunted title of "rational" goes to prove in what an unsatisfactory condition the science which treats of the cure of disease really is.

(*To be continued.*)

MIDLAND COUNTIES VETERINARY ASSOCIATION.

(Continued from page 146.)

In regard to quittor arising beneath the wall, he considered the immediate effect of the injury was limited laminitis. When the laminæ only were involved the disease quickly subsided under appropriate treatment. Frequently, however, owing to pressure of exudate or of pus the underlying parts were damaged, and the lateral cartilage or pedal bone was attacked by necrosis. Quittor caused by tread was often preceded by sloughing. When the cavity was probed a sinus (or sinuses) more or less deep would be found. In some cases the cartilage could be felt from the start. Severe injury inflicted on the coronet was commonly followed by cartilaginous quittor. In his experience the cartilage was necrosed very early but owing to the swollen coronet diagnosis was not certain. He considered quittor associated with slowly progressive necrosis of the lateral cartilage the worst form they had to deal with. The Professor then explained—demonstrating his explanation in a most minute manner—how necrosis attacked the cartilage, why the process extended always from behind forwards and destroyed sometimes a superficial layer, sometimes the whole thickness of the plate; and referred to coronary swelling, secondary abscess, septic discharge, caries, and various other changes which took place in the foot in consequence of the disease. Having alluded to the value of careful observation of the number, depth and direction of the sinuses, the characters of the discharge and granulations, and the varying symptoms of pain, lameness and knuckling, he proceeded to notice the treatment of quittor which, he said, had undergone very little change for many years. In some districts to-day the treatment was carried out on lines similar to those followed by the farriers of the seventeenth century. Markham (1656) employed the actual cautery and the razor. He used an iron shaped like a trident. With that instrument he cauterised the swollen coronet and filled the grooves with corrosive sublimate. If failure resulted he had recourse to the razor and removed the diseased parts.

Solleysel (1664) said that quittor could be treated in three ways; by giving the fire, by the razor, and by caustics, and added that "the main scope of the cure is to take out the gristle" which showed that cartilaginous quittor was not unknown in his day.

The caustic used by Solleysel was composed of two drams aloes, six drams sublimate, moistened with spirit of wine to make a little ball to be thrust into the hole.

In this country at the present time quittor was treated by the actual cautery, potential caustics, solid and liquid, by antiseptics, by bold incisions aided by caustics, and by excision of the diseased parts.

Professor Macqueen was not in favour of the hot iron as a remedy for quittor, but he was prepared to hear that it was of great service in cases affecting the posterior half of the foot, where little or no harm would follow its use. With regard to caustic paste in treatment by plugging—practised to cause sloughing—he believed it was very effective in some cases, but quittors likely to be improved by that method required careful selection. He did not not now use caustic paste because much time was lost in waiting its beneficial action. One marked objection to caustics used in that form was that the plug could not always be introduced far enough without serious risk of damage to healthy parts.

Injections he had employed for many years, often in conjunction with the

knife. In speaking of injections he desired to give credit to Charles Newport (1829) of Gray's Inn Lane, who first used them in the treatment of quittor. In the first volume of *The Veterinarian*, Newport reported his discovery. Newport's injection was a saturated solution of zinc sulphate. The injection was repeated every 24 hours and three or four injections were sufficient. The excellent results which followed Newport's plan were acknowledged by Bracy Clarke and affirmed by Sewell and Percivall. In France, in 1847, one Mariage reported some astonishingly successful cases treated by injection of Villate's solution. Villate, who was veterinary surgeon to Louis Phillipe, claimed to have used the solution since 1829. It was possible that Villate was indebted to Newport's father for suggestions as to the composition of an injection for quittor. It was a remarkable fact that in 1800 the French King resided for a time at Twickenham, and subsequently at Claremont where he died in 1850. It was not improbable that Newport and Villate exchanged ideas on the treatment of quittor for Villate's solution was similar to that used by Newport. Professor Macqueen had used Villate's solution and he strongly recommended it to anyone having a case in hand. He believed it was the best injection for quittor. The solution he used was made of two ozs. zinc sulphate, two ozs. copper sulphate, 35 ozs. dilute acetic acid, and four ozs. Goulard's extract. He injected the solution two or three times a day for three or four days, or until blood followed the return of the injection. Many cases required two injections daily for a week, and like every remedy it sometimes failed completely. He had tried Cherry's injection of a ten per cent. spirituous solution of mercuric chloride, but Villate's lotion was more successful. Other injections of which he could not speak from much experience were spirit of turpentine, petroleum, perchloride of iron, chloride of zinc, pure carbolic acid.

For many years he had treated all chronic cases by excision of the diseased parts. The operation of extirpation of the lateral cartilage was introduced by the elder Lafosse in 1745, improved by his son, and practised for many years, until 1850, by many of the leading veterinary surgeons on the continent. The operation somehow was never tried in this country, and since the publication of successes with injections, it had apparently fallen into desuetude in France. Lafosse's operation was too extensive, too radical, and, in consequence, recovery was protracted beyond modern patience; the animal not unfrequently succumbed to some complication. In those days they believed that the lateral cartilage, invaded by necrosis, had no power to cicatrize. Extirpation was considered the only treatment in such an event, and all the skill of the operator was required to avoid wounding the pedal joint.

In 1851, Bouley introduced the modified operation of partial excision of the cartilage. The necrosed cartilage was carefully removed. Separation was affected sometimes unwittingly by caustics and injections. The French surgeons did not sanction excision of any part of the coronary band or sensitive laminæ. In order to reach the cartilage, the coronary band was separated by incision from the sensitive laminæ, and carefully raised from the cartilage.

Professor Macqueen did not spare the coronary band or sensitive laminæ when he found those parts diseased. He did not unnecessarily damage those structures; at the same time he was confident that excision of a piece of coronary band, or removal of a few sensitive laminæ, had not the untoward consequences so much dreaded in former days. He then explained the treatment he practised. Given an average case, he would remove the shoe, and poultice the foot for 24 hours. The sinus was then probed to ascertain its depth and direction, and the wall rasped thin all over and a little beyond the area of disease. The horse was then cast, and a tourniquet applied

above the knee or below the hock, according to the limb. The foot was made secure. Two converging incisions were made through the coronary band to the extremity of the sinus, and the "triangle" of hoof and band was dissected out. The wound was then examined, and every vestige of unhealthy tissue—bone, laminæ, cartilage or fibrous tissue—removed. If necessary, he sharp-spooned the bone and cartilage, or excised the necrosed part. The wound surface was then washed with carbolic lotion, dried, and filled with carbolised wool, saturated with oil of cloves. A pledget of tow was placed over the wool, and the whole dressing maintained by a surgical bandage. As a rule, he did not renew the dressing for six or eight days. He then referred to the subsequent treatment, the progress of the case, mode of healing and possible complications, and dealt with open pedal joint, false quarter, ossification of cartilage, deformation of hoof and enlarged coronet.

In conclusion, he showed the instruments, sage knives, renettes, sharp spoon, pad saw, tenaculum, tourniquet, etc., which he used in the operation; a set of castrating clams for the standing operation sent to him by Mr. Renfrew, of Glasgow, and exhibited a new electric battery and lamp especially designed for veterinary practice by Mr. Scales, who had furnished him with the following particulars: "The battery lasts from 15 to 18 months if used not more than ten minutes daily. The lamp lasts 100 hours. The cells may be renewed at a cost of 7s. 6d. for the three. The lamp may be renewed for 4s. Tubes may be had of any size. or according to order. The price of the whole apparatus is 30s., and it may be obtained from Mr. Protheroe, Bourn House, Leytonstone, Essex."

Discussion.

Mr. WRAGG said the members of the Association were much indebted to Professor Macqueen for his interesting and instructive paper, which had been so well demonstrated. Referring to the various kinds of quittor, he disliked the quittor caused from suppurating corns. For 25 years he had been in the habit of using the knife, and he had no hesitation in cutting away the coronary band as some had, and his experience was that the foot would resume its normal appearance in most cases where the knife was used, without any false quarter. He did not care much about using the hot iron.

Mr. CARLESS said he was very pleased with the able address the Professor had given them, and that he had gained from it that which he did not previously know. They in the country did not come across cases of quittor so much as those in large towns did. The rule with them was to relieve the pressure below and above as much as possible, and treat the cases in the ordinary way. The operation of cutting away the coronary band he could vouch for as being not at all dangerous. He was much pleased with the lamp, and also the tourniquet exhibited by the Professor.

Mr. PARKER favoured the use of an injection.

Mr. WARTNABY said he was highly interested in all he had heard that afternoon, and had learned a great deal with regard to quittor. In the few cases he had had, he was pleased to say he had been successful, and he had relied mainly on the knife.

Mr. BARKER had had many bad cases under his notice, and, as a rule, he pursued one line of treatment, and had found it successful. He agreed with the system that Professor Williams had initiated. He punctured the wound with a hot iron, and then put in a mixture of a few grains of bichloride of mercury and arsenic, wrapped in a bit of tissue paper. On the top of that he placed a big poultice, and after the slough had come out, he used a little sulphate of zinc.

Mr. JONES asked Professor Macqueen whether he used the tourniquet above or below the knee, and whether he did not find a good deal of hœmorrhage

when he took the tourniquet off. That being the case the bandage he used would, he thought, have to be removed under the eight days as he had stated.

The PRESIDENT thanked Professor Macqueen for coming down and delivering so interesting an address. His (the President's) experience of quittor was very much the same as that of Mr. Carless—that they did not get many in the agricultural towns. He proposed a vote of thanks to Professor Macqueen for his address, which was unanimously agreed to.

Professor MACQUEEN, in reply, said when operating on the fore limb he generally placed the tourniquet above the knee, and when operating on the hind limb just below the hock. As to the hœmorrhage, he removed the tourniquet immediately after the foot was dressed. He dressed the foot while the horse was down. The amount of hœmorrhage was sometimes great and sometimes very little. He again said he thought the worst kind of quittor was that arising from a coronary tread. He advocated a very early removal of the tourniquet, or otherwise lameness might be caused. Referring to the discharge from a wound in the case of quittor after treatment, he said so long as it was of the nature of a healthy discharge no alarm need be created. After the removal of the bandage he applied cold water.

Dr. CLIFTON, on the part of the medical practitioners in Northampton, begged to thank the President for inviting them to the gathering that day, and also to thank Professor Macqueen for his interesting address.

The PRESIDENT, in reply, said he should be very pleased if they saw the medical gentlemen of the different towns in which they assembled oftener at their meetings. He again tendered his thanks to Professor Macqueen, and said that at their next meeting he should propose him as an honorary associate of the Association.

The proceedings of the meeting then terminated.

The Dinner.

Many of those present were then compelled to leave by train, but the remainder, to the number of about twenty-five, sat down to a *récherché* dinner at the George Hotel. The President occupied the chair, and Mr. T. J. Merrick the vice-chair.

At the conclusion of the dinner the President proposed "The Queen, the Prince and Princess of Wales, and the rest of the Royal Family." He referred to the Queen and the Prince of Wales as being good supporters of the veterinary profession, and also made a pleasing allusion to the betrothal of the Duke of York and the Princess May.

Mr. CARLESS proposed "The President." He said he had known Mr. T. H. Merrick for several years, and his father for a much longer time, and their uprightness of conduct, their general good nature and hospitality had won for them the respect and esteem of the members of the Association and the profession generally. He wished both the President and his father long life and happiness, and hoped they might have the pleasure of meeting them again at a similar gathering in Northampton. The toast was received with acclamation.

The PRESIDENT expressed his pleasure at the manner in which the toast was received, and in seeing so many friends present at their gathering that day. He also thanked those present for the kindly way in which they had received the name of his father, as the hospitality extended to them that day was as much due to him as to himself. He hoped every meeting during his year of office would be as well attended as the meeting of that day and be equally as pleasant.

Mr. PARKER submitted "The Visitors," and coupled the names of Professor Macqueen and Mr. Thomas Thorne with the toast. Speaking of the professor, Mr. Parker said he felt sure the college had received a great acquisition in the person of Professor Macqueen.

Professor MACQUEEN expressed the pleasure it gave him to be present that day, and said the reason perhaps why he had not been oftener seen in the provinces was because he felt that no teacher should make his appearance in the way he had that day until he had had some considerable experience, and knew fully what he was speaking upon.

Mr. THORNE, who is a comedian, made a most humorous reply to the toast.

Mr. WRAGG proposed "The Health of Mr. Merrick, sen." Mr. Merrick, whom he had known for a great number of years, had contributed largely to the success of their Association, of which he was an ornament. He had also given the greatest hospitality to the members whenever they visited the town. The toast was most heartily received.

Mr. MERRICK, in the course of his reply, said it always gave him great pleasure to meet the members of the Association, and especially so on that occasion, when they had done him the honour of electing his son as President. He trusted that during his year of office his son would conduct the business of the Association to the satisfaction of the members and the advancement of the Association.

The remainder of the evening was spent in harmony.

H. J. DAWES, *Hon. Sec.*

LINCOLNSHIRE VETERINARY MEDICAL ASSOCIATION.

(Continued from page 141.*)*

Professor PENBERTHY then read a highly original and interesting paper as follows :—

"BLOOD-LETTING, BLISTERING AND PHYSICKING."

Mr. President and Gentlemen,—When our president-elect did me the honour of asking me to introduce a subject to your notice to-day, I experienced the usual difficulties in making a choice, and would fain have asked him to confer the honour on someone more prepared to tell you something new or authoritative. I could not, however, forego the pleasure of meeting you all again—a pleasure enhanced by the fact that I should be at the inauguration of our old friend as president, and to have the opportunity of congratulating him on the honourable position to which he has attained, and of which I am confident, from a personal knowledge of his qualification, he will maintain. I hope Mr. President and the members will accept my congratulation.

I have little doubt that the heading under which I have elected to make a few brief remarks to-day may have excited some little wonderment. At the outset, I need scarcely say that it is not my intention to make an attempt to enter into or even touch on all the numerous details which might naturally fall within the category of bleed, blister, and physic. What with general business of the annual meeting and the presidential address, there will be, I presume, little disposition for anything more of a very deep or solid nature until we reach a "degree" beyond that of professional business. Those who were so wise as to advise us to "drink deep of the Pyærean spring," would, I believe, allow of dangers of drinking too deeply, so I have ventured on what may be deemed the superficial. Remarks which fell from a speaker at a veterinary meeting a short time ago, appeared to me to indicate a low estimate of therapeutic agencies which had sprung from what he was pleased to term "superstition," and excited in my mind a comparison between present and past practice of veterinary medicine and surgery—between our so-called scientific treatment and that of the old "bleed, blister, and physic" school: that school which gained for us in comparatively recent years the title "cow-leech," a name applied to us in a rather opprobrious sense from the idea of

our frequent blood-letting propensities, but for whose proper origin and more acceptable meaning we must look to the Saxon "læce" of "lechian," "to heal." In old Bailey's Dictionary we find "Leech—a farrier or horse-doctor." It is a common expression "The present is an age of fact rather than of faith," and perhaps we are a little too disposed to regard what has come before our time as an outcome of ignorance and unscientific, and to set it aside as useless on no other grounds than that it came into vogue before the so-called days of science. I am inclined to think we may hold too restricted views of what science is, and to attach the term rather exclusively to the immediate outcome of laboratory experiments. Surely the facts adduced from clinical observation and practice have a very large claim credit in the accumulation of the scientific knowledge we now possess and on our gratitude, and I should like to record, whenever opportunity occurs, my respect for those in practice who have observed and chronicled their observations. Fashion in every department of society has its followers, and there is ever and everywhere the "leaving the old love for the new." No department has yielded more forcible instances of this human tendency than that of medicine. Yet, to the credit of her constancy, at least, it must be said the veterinary branch has stuck steadfast to two points of her character—blister and physic, and I would venture to assert, too, to the credit of the powers of observation of her members. Because it is not possible at any time to explain the manner in which an agent acts in inducing the cure of disease, it may not be inferred that the adoption of it is irrational. In few other branches of study is it more difficult to scientifically account for the occurrence of circumstances which experience has taught us to be facts. In many instances, with respect to the action of medicines in the restoration of normal conditions, the effect may be dogmatically declared, while the mode by which the change has been brought about is wrapt in obscurity. When one looks into the dark past of medicine one is lost for power to conceive the circumstances which induced our forefathers to adopt certain agents and practices, and on turning to regard the effect of the light of scientific research in proving that these agencies are in many cases most correctly applied, our wonderment is only intensified, and we are led to inquire into the means which have sustained their existence. I presume it is merely a "survival of the fittest," and though prejudice or fashion may have driven some of the useful towards the wall, matters will right themselves in time. The survival of the older useful practices to me is an outcome of the observation of our fathers. A little inquiry will show us that the most efficacious modes of treatment, based on the most shallow or absurd theories, have held their ground, and the true theory has had to be tacked on to the practice which has thereby been proved to be on sound principles. "Practice with theory" is a wise axiom or motto. Practice before theory savours of the "cart before the horse," and, probably, is an equally cumbersome manner of progression, but even in this way progress may be made, and this progress slow but sure.

In order to keep myself within the scope of the title, I propose to offer a few remarks on the several heads separately.

Blood-letting, I think I may say, has fallen into all but general disuse. The fleam, the most constant, and it may be remarked. the most deadly companion of our fathers, is an instrument which a large number of veterinary surgeons of the present day have not even possessed. Half a century ago, few horses or cows whether sick, sore, sorry, or in perfect health, escaped being bled once or more in a life-time.

As to the origin of bleeding there is little doubt that it was associated with the so-called humoral pathology, "which held that there were so many humours, bile, phlegm, or melancholy, and so many fluxes by which the humours could be removed, those of the belly, those of the sweat, those of

the urine, &c., and old Solysell, in his "Perfect Marshall or Compleat Farrier," written in the seventeenth century, says: "Nature sometimes delivers herself of her troubles by great loss of blood, which is that has led physicians to trace nature foot by foot, and to procure sometimes one evacuation and sometimes another, according to the quality of the humour offending and the place where it lurks; it is certain there is no evacuation so ready, so easy, so agreeable, and so beneficial as blood-letting." This idea of regarding disease as an entity, having a corporeal existence, was very simple, and there is little wonder at the practice of attempting to extract it by withdrawal with the blood, &c. At any rate, the practice grew amongst surgeons, or barbers, and veterinary surgeons or farriers so rapidly, and was thought so highly of, that at the beginning of this century it was adopted as a preventive or cure of almost every disease—systemic and local, of men and lower animals. Valour extinguished discretion, and it came to be seen that bleeding killed more than it cured. At the early part of this century, in the human subject there was a great prevalence of disease of an asthenic, depressing type, conditions in which the conservation of all the forces of the body was most important. Medical knowledge began to rapidly develop, and it was recognised that the number of the victims to blood-letting was terrible, and the death-knell of the practice was heard far and wide. In human surgery its disuse soon became complete. Veterinary surgery followed suit to a great extent, till at the present moment it can scarcely be said to have other than a bare existence. Men have become quite unfamiliar with the operation, and, as a natural result, less disposed to do it. Indeed, there are hundreds of veterinary surgeons who have never seen an animal bled. The wholesale indiscriminate use of flean and lancet we would condemn as forcibly as possible, but still there appears to be room for the question, Has not the reaction been too radical? Should it be so discarded? May no useful purpose be served by bleeding? Indeed, should it not be regarded with more favour than at present? We believe that in the majority of cases in which it was formerly adopted, its use could not now be justified. In many cases it was highly injurious. In others, like effects might have been induced by other means less heroic. But in some few conditions I am disposed to doubt if any other practice can induce like results. The great advantages of blood-letting depend on its rapidity of action. In embarrassment of the right side of the heart, associated with congestion of the lungs, where the pulmonary circulation is impeded and danger is imminent, from the fact that the right heart becomes over-distended, and as it were, loses its "grip" on the blood, it ineffectually presses, or its contents becomes more and more stretched and powerless, the blood pressure rises, the blood is driven into the veins, and cannot get out of them for the arrest in the lungs. Distressing symptoms associated with these are familiar to us. If in such a case the engorged jugular is boldly opened and blood taken in a copious stream, the heart becomes less distended, is enabled to grip its contents and exert its muscular force on them, and consequently on the blood in the pulmonary vessels which passes on oxygenated, and the symptoms of approaching asphyxia sometimes pass off as quickly as they come on. The left side of the heart, too, may become engorged and embarrassed, when the opening of an artery has a somewhat similar effect. In these we have what may be termed a mechanical means of relief, and experience tells us that from the operation there is little to fear. The abstraction of blood is not only a cardiac sedative, but its withdrawal from the nerve centres induces in them the sedative effect. We all appreciate this, and know it may be carried to fainting. This, in association with temporary reduction in the bulk of the blood, has in all painful diseases of an inflammatory nature, the effect of reducing the blood pressure, and may, in the early stages of such diseases as pleurisy and peritonitis, avert the evil consequences of exudation which are

believed to depend on increased arterial and cardiac force from without the inflammatory area. The removal of pressure in the cerebral vessels where apoplexy and other vascular disturbances are imminent, must be an important item of treatment. This may be effected after a time by drugs, but I think it may be held that blood-letting is the most rapidly acting sedative we yet possess.

In cases where the blood is highly charged with poisonous matters whose effects are nearly culminating, what means so direct or easy for reducing the amount in the system at any given time?

Percival, writing on inflammation in 1834, says: "Indeed, in veterinary practice it (*blood-letting*) not only forms our most decisive means of cure, but in many cases is the only remedy we have it in our power to employ with any chance of success. A study of Percival's reasons certainly show a great advance on those of Solysell, but this agreeable writer advances many views which are scarcely tolerable. Strangely enough, following the false ideas prevailing in Solysell's time, the operation of phlebotomy became popular, while the decline of this practice commenced soon after Percival's publication. By these remarks I do not imply that I would desire to see a return to the indiscriminate use of the fleam and lancet. Blood-letting, if it be of any service, must be adopted in response to the dictates of professional knowledge and common sense.

Turning to the second head of my title, "Blistering," I think we may take it that this mode of treatment, in veterinary practice at least, has fairly held its ground. Yet if we look far back, and regard the theories on which the practice was based, we shall find that not one of them hold water, and we are led to ask why they have retained their influence up to the present. The answer must be that clinical observation has shown their value.

Blisters as counter-irritants appear, like blood-letting, to have been an outcome of the idea that disease was a something with bodily form, and could be drawn or driven from one part of the body to the other, and, more recently, based on the false assumption that no two inflammations could exist in the body at the same time.

Advance in physiology and pathology by experimental research has shown that the result of irritation or injury to the vessels of one part, such as is produced by a blister, is to produce a marked effect on the rest of the vascular system—dilatation in the injured part and contraction in the uninjured. Experiment seems also to show that irritation of certain external areas is followed by change in the vessels of certain definite internal areas or organs; thus, if an irritating fluid is placed on a definite spot on one wing of a bat (a transparent object), the vessels in the corresponding area shows marked contraction. Application to the loins of other animals induce similar changes in the vessels of the kidneys.

Blisters have an excitant action on the heart, and must be classed among the more powerful cardiac stimulants; they call forth latent energy and act as general stimulants when there is a "hanging fire," as certain conditions are sometimes expressed. For this purpose they are sometimes used to excite and overcome the stupor in opium poisoning. They appear to prevent effusions, and sometimes excite their removal. They relieve pain and increase the number of leucocytes. And recent experiment seems to suggest that during the action of blisters a material is formed which may be absorbed into the blood, and induce an injurious effect on micro-organisms. So that in such diseases as acute pneumonia, depending on micrococci—in which cases stimulation of the chest wall was formerly so much in vogue, but more recently regarded as absurd—it is possible the application of c.i. may be productive of good. Few of us who have carefully marked the temperature as gauged by the thermometer can scarce have failed to observe that frequently the mercury makes a decided

and steady decline after the rise from the blister, especially in cases where the temperature has been of an oscillating character. It appears to have a power of bringing matters to a "head," as it were, where everything else fails. In cases of pleurisy or peritonitis, which have taken to "hanging fire," this is often remarkable.

It must not be thought for a moment that I would advocate indiscriminate blistering. The measure is a depletive one, induces pain, robs the blood of its nutriment, and excites tissue change and waste. I recognise its power of killing as well as curing, and I hold very strongly the opinion that the Society for the Prevention of Cruelty to Animals would fulfil its functions much more satisfactorily if it took up the cudgels against lay blistering, than of prosecuting veterinary surgeons for amputating tails or firing limbs, just to gratify and foster the spirit of neighbouring veterinary surgeons or maudling sentimentality. The numerous cases we are called upon to treat, in which the owner or the attendant has blistered an animal in a perfectly healthy part and left unobserved the seat of disease or lameness, and thus inducing the most unnecessary pain, call for the interference of some such Society, and on the score of humanity as well as sometimes to our own pecuniary and professional interests, we should assist in the prosecution of such a reprehensible practice. If pain could be measured, I believe it would be found that from this one act of indiscriminate blistering more suffering to animal life is caused, than by all the other means of which the Society for the Prevention of Cruelty to Animals takes cognisance. But to the main object in view. I regard blistering as a most powerful means of treatment, and that the survival of its practice is due to the effect of clinical observation rather than the theory on which it was originally adopted, and that the result of more recent experimental investigation proves the correctness of the observation rather than the theory on which it has been adopted or carried out.

The third head of our title, "Physic," has become, in the veterinary mind, restricted to purgatives. That the application of these to horses was very general at least 200 years ago, we may fairly infer from the writings of the 17th century. Solysell commences his dissertation on "Purging in general," by giving three lengthy reasons why they should not be so commonly used. "First, it is certain that the seldomer a man purges a horse, it will always be the safest side he chooseth, for it should never be attempted without a great necessity, seeing they are so easily inflamed, and so much the more readily; because they require a great quantity of drugs to purge them, which cannot possibly be given without impressing a strange heat in them, and may degenerate into fever, &c,, &c.

"The second reason why horses should not be purged, except in a great necessity, is that the medicines are commonly twenty-four hours in their bodies before they begin to operate, so that during that time they always overheat or heat some of the parts.

"The third reason for which we should observe exact precautions in purging, proceeds from the difficulty of knowing the condition of the disease, and the disposition of the humours which, when concocted and digested by nature, are easily evacuated, but, being crude and unprepared, are rebellious, and don't yield to the remedy."

I quote these few lines rather to show the mode of reasoning, or the substitute for it, than to adduce it in argument of my own.

To refer to Percival once more, as representing the views of his time, now sixty years ago. He says:—"Purging constitutes the most powerful means we possess in the shape of medicine of reducing inflammation. It is a remedy to which we have almost universal recourse, one which everybody employs without apprehension of danger, and generally-speaking with salutary consequences. In fact, of such immense importance and value is this operation to

us in veterinary medicine that had we no means of purging the animal, our art would not be worth practising. So insignificant are all other medicinal agents when put in comparison with purgatives." The writer then goes on to give a *modus operandi* much nearer that we now conceive correct than antiquated Solysell, whose remarks, viewed in the light of our present knowledge are apt to excite a feeling of merriment if not of ridicule. Up to and long beyond Percival's time we find no evidence of a proper conception of the manner in which purgatives affect the system. Yet we have heard Percival's estimate of them, and we all know how general is their use, and to a greater or lesser extent how beneficial is their action. The good bold dose of physic is still the sheet anchor of many, and we venture to think in numberless cases the most fitting treatment, but I have thought that Percival has been followed somewhat blindly, and that still the dose of physic is often used to cloak our ignorance, and often causes a good deal of unnecessary inconvenience to the horse. To clear out the bowels seems to be the great object in life of some veterinary surgeons. We know that purgatives act in three ways, (1) by stimulating the peristaltic action, (2) by increasing the secretion from the bowels, and (3) by preventing absorption from the lumen of the intestines into their vessels. One important use certainly is the expulsion of fœcal matters, and removal of irritation which these cause, and judging from the disagreeable symptoms and injurious effect induced by many intestinal irritants, as worms, etc., as well as those due to absorption of toxic matters resulting from decomposition of food, etc., their value on this score in numerous instances can scarcely be overestimated. But beyond this action of removing matters causing trouble by the undue fœcal accumulation, purgatives have a far-reaching effect. By withdrawal of the watery constituents of the blood, blood pressure is reduced, and congestion of important vascular parts averted or relieved. When capillary rupture has occurred, further hæmorrhage may be prevented. Water drawn off by the bowels relieves the kidneys sometimes when relief means recovery. As the blood will have its normal proportion of water, this fluid must be absorbed into the blood stream from the tissues, and thus we have reduction of the swellings of dropsy, œdema, etc. Tapping the liver vessels, as it were, it relieves congestion of the radicles of the portal vein. And with the withdrawal of fluid into the intestines probably come toxic and deleterious matters thus discharged from the system. And though the mode of action is not understood, saline purgatives especially have the effect of reducing febrile temperature.

In veterinary practice we fear the use of physic, as it is called, has not always been adopted with that amount of careful reasoning that might be accorded to it, and we cannot but think and express the conviction that even to-day the constant outcry for physic should not be acceded to by the profession. Some less active and annoying agency might be adopted in some of the imaginary conditions, when the owner or attendant has an itching to do something to "reduce his grossness" or "to do him good." Yet notwithstanding this common misapplication of the purgative, when we consider how the actions before-mentioned may beneficially effect an animal in such a variety of forms of indisposition, it is not surprising that their use has become so general. Here, again, the practice has preceded the elucidation of the mode of action, and started on theories absolutely fallacious, observation of its effects has maintained its use and reputation. A review of the practice of medicine would afford innumerable instances of this order of things which, of course, obtains beyond the region of the healing art; indeed, leaves scarcely any sphere untouched. Yearly, if not daily, we have introduced some new drug or agency, which, in the majority of instance, has an ephemeral existence, for a time absorbing the theoretical mind, and by its effects leaving no permanent impression as to its good. Aloes Solysell mentions as the best purgative for

horses. We might name opium, bark, their alkaloids, tar, turpentine, colocynth, jalap, mercury, arsenic, and ask if these do not still speak for themselves and the discernment of the members of the old school, so called, impirical.

I am afraid, gentlemen, I have wearied you by these rambling remarks, but I have been struck by the tendency of the present day, which I daresay always existed, to run after the new and too often to discard the old, and in the advance or retreat, if there has not been the disposition to throw the parting stone, I think there is the fear that credit due to the results of clinical observation has not been freely given. Theory with practice. We owe most of our debts to the observations of sound, practical men, truly scientific, and I think this form of obtaining information requires stimulation and encouragement. The power of observation is our greatest faculty, and its cultivation should be our greatest care.

I have no thought and would utter no expression in opposition to the tendency of the present age to inquire into the why and wherefore of things. I hail the scientific explanation as our safeguard in the use as well as the detection of the abuse, and in the extension of our usefulness. But in the onward march of the profession I claim an honourable place for the outcome of the practice, apart from the new scientific methods, as I have tried to indicate that in the history of medicine results have proved that practical observation, and not correct or incorrect theory, has been the principal factor in maintaining practice of methods and medicines which more recent scientific research has shown *a posteriori* to be the fittest. The process has been slow but sure. Practice as a superstructure of the correct theory I believe even more sure, and that which we should aim at, but it is not wise to forget the bridge which carried us safely over. The interchange of experience which must accrue to such meetings as that of our society, where the results of actual practice are brought before them, must always be beneficial, and the publication of the proceedings I regard as one of the most important means of professional improvement; and as I commenced my remarks by congratulating our president, I will conclude them by wishing him and the society over which he presides a happy and useful year of office, and I shall look forward with pleasure to the reports of this society for the outcome of your several experiences in professional matters.

The PRESIDENT said they had heard with great pleasure the splendid paper which Professor Penberthy had been good enough to give them. He could only say as President that he could not find words to thank him sufficiently for coming there and reading a paper such as he had given them. He hoped that from it they had learned a great deal, and that they would all join in the discussion, from which he hoped to learn something more. He felt that he should be meeting the views of all present by asking Professor Williams to address them,

Professor WILLIAMS expressed his pleasure at having had the opportunity of hearing Professor Penberthy on so interesting a subject. He made a few remarks on the same subject at Manchester lately, and in those observations he referred principally to the first part—blood-letting. He pointed out then the very great dangers that had been incurred by it in the practice of veterinary medicine in the old days. The practitioners of those days considered it the proper thing, and those who differed from them were looked upon as heterodox, and beyond the pale of civilisation. For his own part, he had placed himself beyond the pale of civilisation, and he might almost say of professional recognition, by becoming years ago heterodox on some of the subjects treated by Professor Penberthy. He believed in blood-letting for the relief of mechanical congestion, such as pulmonary apoplexy, where the distention of the right side of the heart became dangerous to life, and the heart itself weak and seeming to have lost its grip of the blood, and the mus-

cular tissue was so extended that it could not contract upon it. In those cases he advised blood to be withdrawn, and so get the pressure diminished at once, and the heart's grip restored. He had seen several cases where almost immediately by the withdrawal of blood, by which the pressure was removed, the heart and vessels regained their tonicity and elasticity, and the circulation again went on in a natural manner. He had made the experiment of destroying a dog by strangling and opening the chest immediately afterwards, when it would be found that the lungs looked white although the arteries were full of blood. If they had pressure of blood on the right side of the heart, he believed bleeding to be the best treatment, as it mechanically removed the congestion. He had bled in parturient apoplexy, though, as he had not seen many cases of late years, the disease might have somewhat changed its type; at the time he practised amongst it, he believed that the mechanical relief given to the congested brain by bleeding was in many cases followed by a distinct improvement in the symptoms. He had seen cows begin to recover consciousness before the blood had ceased to flow, and at the same time the pulse increased in tone and volume. In those cases in parturient apoplexy where the pulse was fluttering and indistinct, and the animal might almost be said to be pulseless, he had seen the pulse improve in a marked manner on the withdrawal of blood, simply because by this means the pressure on the brain was diminished. He did not say that in those cases the percentage of recoveries was great, but he thought that venesection induced a decided improvement in the symptoms. In cases of inflammation, he thought bleeding did harm, because inflammation occurring in a part of the body was often a reparative process, pure and simple. Some years ago he gave expression to the idea that the exudation of inflammation was sometimes arrested by a blister. In lymphangitis, the animal at first was excessively lame, but as the swelling increased the lameness diminished. The more rapid the swelling, the greater the diminution of the pain. He was of opinion that the swelling diluted the irritant in the same manner as a blister applied to the surface. Sir Joseph Lister had explained that when a part was inflamed, it was preyed upon and its vitality diminished. There were numerous organisms always ready to fall upon any tissue or part of the body the vitality of which was lowered by disease, and if sufficiently powerful would destroy it: then the whole lymphatic system was aroused, and the white corpuscles rushed in as an army of defence, and it then became a battle between the noxious germs and the white corpuscles which had arrived to fight them. If the white corpuscles conquered then the part was restored wholly or partially, but if not the part would die. If it be true then that blisters did diminish the number of white corpuscles, he said it was wrong to apply them, as they were interfering with the defence set up by nature.

He maintained that when inflammation was set up it would go through a definite course to its natural termination. He held that it was entirely wrong, in cases of chest disease, to apply a counter irritant to the sides of the chest. Professor Penberthy had told them that a blister would diminish the temperature, but he held that it elevated the temperature, and they ran a great risk in many cases by so doing. (Professor Penberthy: I said it elevated it at first.) He said it interfered with the process of nature, and the blood rushed to the inflamed part. Professor Williams then said that lately he had had several cases of thickening of muscles and tendons which had been successfully treated by setting up the reparative process by injection into the tissues affected. He related an interesting case of chronic thickening of the flexor brachii, accompanied by great lameness, which had become perfectly restored by injections of tincture of iodine into the substance of the muscle. When, however, inflammation was chronic, they might look upon it as non-reparative, and in these cases a blister often brought the natural process of exudation,

and if no alteration of structure had occurred, the tissue might be restored to its natural condition.

As to physic, they had got into the way in Scotland of giving very little physic. As they all knew, in Scotland a much larger dose was required to induce purgation, and this, he thought, was due to the amount of woody fibre contained in their forage; eight to ten drams was their usual dose. He almost thought that the time would come when the practice of giving aloes would not obtain, as it had done in the past. It had a very depressing effect on the system, and he had seen repeatedly cases of laminitis succeeding purgation, particularly when given in diseases of the feet, as pricks in shoeing, &c. The professor then went on to cite cases in support of this contention, and at the conclusion of his address was heartily applauded.

Mr. H. J. GOODALL said that he remembered the time when dealers always bled horses that showed themselves lively on their way home from a fair, for fear they should have an inflammatory attack before reaching their destination. He also said that he found it absolutely essential to bleed horses which had an attack of congestion of the lungs in the hunting field, as if bled they were fit for work again in a fortnight, but when otherwise treated the time taken to render them fit for service was usually not less than two months He had found bleeding before service very effective in mares that were shy breeders. Last year he bled six mares which had not had a foal for at least two years, and some of them for a longer period, and they all, without exception, proved in foal. He could not say he had been successful in bleeding in parturient apoplexy, as he did not remember a case ever having recovered when so treated. Referring to counter-irritants, he said that the thermo-cautery required using very carefully, as it was liable to produce extensive sloughing of the parts operated on. He complimented Professor Penberthy on his paper, and in reference to physic related the case of a horse which could only be kept in working condition by the administration of three drams of aloes twice a week.

Mr. B. FREER continued the discussion, stating that he was of opinion that in many cases, when seen early, bleeding would cut short an attack of lymphangitis and render it much less severe than it would have been when otherwise treated. He supported Mr. Goodall in his treatment of pneumonic congestion, and said that the most dangerous cases they had of that disease were those which would not bleed. A fatal termination might usually be expected in these cases. He was an advocate of the use of aloes as a purgative in preference to linseed oil, which, in his opinion, was responsible for many severe cases of super-purgation. He was in favour of a moderate use of blisters, and had known many cases of laryngitis where there was great dyspnœa to be very much relieved by a smart blister to the throat. He confirmed Mr. Goodall's experience of the thermo-cautery, and related an interesting case of eczema, which, having been treated for some time with varying success, was sent to his infirmary for further treatment, and to have its fore-legs blistered at the same time. After the application of the blister there was a very great improvement in the symptoms of the eczema, which gradually disappeared, this effect being, in the speaker's opinion, due to the absorption of cantharadine.

Mr. J. MACKINDER said that bleeding had to a great extent ceased in his practice, but he agreed with Mr. Goodall as to the good effect produced by bleeding mares, that were bad breeders, before service. This, he said, was a very common practice with him, and was generally successful. He had found blistering very effective in cases where there was great abdominal pain, and in cases of impaction of the bowels believed that a good dose of physic was essential to a speedy recovery of the patient, he having found that cases treated with sedatives and anodynes were much longer on hand and the

recovery, when effected, was not so complete. He expressed his great obligation to Professor Penberthy for his paper, and did not think that the subjects on which the professor had spoken could have been made so entertaining.

The PRESIDENT, before calling on Professor Penberthy to reply, expressed the very great pleasure it had been to him to have him at that meeting and to hear his very interesting paper. He hoped that the meetings of the Lincolnshire Veterinary Medical Society might be graced by the presence of Professor Penberthy on many future occasions.

Professor PENBERTHY, in reply, thanked the members for the very kind way in which they had treated his paper. He had been very pleased to hear the views of the gentlemen who had spoken, and though he differed from Professor Williams on the subject of blistering in chest diseases, he had heard his (Professor Williams') remarks with great interest. He did not advocate blistering in those cases where the temperature was as high as 108 or 110°F. as it would be certain to produce a fatal termination, but in ordinary cases he considered it a great benefit. In parturient apoplexy, he thought that in the earliest stages bleeding was of service, as if the disease was due, as some thought, to a poison generated during or immediately after parturition, some of it would by this means be eliminated from the system. He thought that the injection of iodine into the substance of a tissue as described by Professor Williams might have a tendency to destroy the leucocytes which were there for the protection of the injured structures. He advocated the use of cantharides in skin diseases, and said he did not think this drug was sufficiently used internally in veterinary practice. In conclusion, Professor Penberthy expressed the very great pleasure it had been to him to come amongst them, especially at the request of so old a friend as the President, and he hoped Mr. Smith's year of office might be a prosperous one to the Society in which he took such a great interest.

Professor WILLIAMS then proposed a vote of thanks to the President. This was seconded by Mr. GRESSWELL, and carried unanimously.

The PRESIDENT having suitably replied, the meeting terminated with a hearty vote of thanks to Professor Penberthy, on the proposition of Mr. GOODALL, seconded by Mr. FREER.

After the meeting the members dined together, the chair being taken by the President (J. SMITH, Esq.), who was supported by J. Clifton, Esq., J.P., Mayor of Peterboro', Professors Williams and Penberthy, and the members present at the meeting. The vice-chair was taken by Mr. GOODALL. After dinner, the usual loyal toasts having been drunk, the health of the visitors was proposed by the PRESIDENT, and responded to in felicitous terms by the MAYOR OF PETERBORO'. On the proposition of Mr. MACKINDER, the President was requested to send a telegram of condolence from the members to the Treasurer, Capt. Russell, expressing their great regret at his illness, and wishing him a speedy restoration to health. The healths of the President and the office-bearers concluded the meeting.

JOHN A. ROBINSON, *Hon. Sec.*

ROYAL AGRICULTURAL SOCIETY.

AT the monthly council held on July 26th, Sir John Thorold presented the following report from Professor Brown:—

Anthrax.—According to the published returns, this disease is increasing in Great Britain. During the four weeks ended July 15th, 45 outbreaks were reported, as compared with 31 in the preceding four weeks.

Swine Fever.—This disease maintains about the same rate of prevalence as it did last year. Since the beginning of the year there have been 1,577

outbreaks reported and 7,726 pigs attacked, as compared with 1,419 outbreaks and 8,015 swine attacked in the corresponding period of last year.

Rabies.—There have been 43 cases of this disease in Great Britain this year, as compared with 18 in the corresponding period of 1892.

Sir Jacob Wilson had laid before the committee a letter from Mr. Clement Stephenson in reference to cases of anthrax in Northumberland. In one of these a farmer, under the impression that an animal had been killed by lightning, skinned and cut up the carcase, afterwards ringing a sow with a litter of pigs. The result was that the pigs had died through inoculation with the anthrax virus, and the farmer himself had become very seriously ill with the same disease. The committee desired to emphasise the great necessity for caution in dealing with the carcases of animals that might have died from anthrax, and would especially point out that on no account should such carcases be cut prior to their burial or destruction. Copies of the recent circular of the Board of Agriculture (A 12c), warning against the danger of handling carcases of animals affected with anthrax, were laid upon the table. Professor Brown had presented a certificate certifying that during the week of the Chester Meeting no outbreak of infectious or contagious disease had occurred in the Showyard. The Secretary had reported that he had been in communication with the Earl of Cawdor in reference to a serious outbreak on his lordship's estate of a disease which was supposed to be quarter-ill. It was arranged that Professor McFadyean should immediately visit the farm where the outbreak occurred, in order to investigate the nature of the disease, and to advise as to the measures to be adopted against its recurrence.

Jurisprudence.

ROYAL COLLEGE OF VETERINARY SURGEONS' PROSECUTIONS.

At the Westminster Police Court, before Mr. de Rutzen, on Wednesday the 16th August, Albert Holbrook was summoned at the instance of the Royal College of Veterinary Surgeons, for an infringement of the 17th section of the Veterinary Surgeons Act.

Mr. Bodilly, of the Council, appeared on behalf of the College, and after briefly stating the facts, and referring the Magistrate to the decision in Robinson's case, called Mr. Thatcher, the College Solicitor, as witness, who produced the Register, on which defendant's name did not appear, and also the authority to prosecute; and stated that on the 11th July last he attended at the defendant's premises, at 1, Little Exeter Street, Sloane Square, and found that they consisted of a blacksmith's shop and forge, and that on the open door were the following words:—

"A. Holbrook, Veterinary Shoeing Forge. With the late T. Witton."

The reason that he went was that he had sent a clerk two or three times, who had been unable to obtain any information, and he therefore went himself.

The defendant stated that he employed a veterinary surgeon, and was therefore entitled to use the word "Veterinary" on his forge, and he produced a card to the witness, and stated that they were the persons whom he employed.

Mr. THATCHER protested that he had no right to make such an assertion without proof, and the Magistrate then asked if the gentlemen named were on the Register. Mr. Thatcher replied that they were both members and one of them a Fellow, and if the defendant's assertion were true he would have to report it, and they would be liable to be struck off the Register for unprofessional conduct.

The Magistrate then asked the defendant whether he would have the case adjourned and call these gentlemen as witnesses, and the defendant, after

some hesitation, said he would rather not. The Magistrate then said that every publicity appeared to have been given to the reported decision of the Queen's Bench Division, and that defendant must have known of it, and that even if he had proved what he had ventured to state, he would still have convicted him; but as it was a first offence he was inclined to deal leniently, and would therefore only fine him 10s. and the costs.

Notes and News.

HORSES IN NEW SOUTH WALES.—From the annual report of the Chief Cattle Inspector of New South Wales, we learn that there are 149,712 draught horses. Light harness horses number 127,969, and saddle horses, 203,735; while the "wild horses" are estimated at 3,151.

FIFTY PERSONS BITTEN BY A MAD WOLF.—The Kieff papers state that on the 3rd inst. a mad wolf bit about fifty persons, amongst them forty-five children, in seven villages of the Rylski district. The wolf appeared in the villages when the whole adult population was in the fields occupied with bringing in the harvest. The wounds of the helpless children, the eldest of whom is five years of age, are described as awful. At last the wolf was killed in the village of Musino, and its head taken to the bacteriological station at Charkoff.

SLAUGHTER OF CATTLE IN SWITZERLAND.—A popular vote was to-day taken throughout Switzerland on a "popular initiative" or demand, which was signed by 83,159 Swiss citizens and was recently submitted to the Federal authorities, calling for the prohibition of the slaughter of animals of all kinds and without exception, unless rendered insensible before they are bled. The demand, which applies to all methods of slaughter and involves the prohibition of the killing of cattle as practised by Jews, has been agreed to by a large majority.—*Reuter.*

WINTER SHOEING OF ARMY HORSES.—Experiments made during last winter in France have shown the necessity for resorting to four frost pegs in each horse-shoe, in order to ensure security of foothold in every kind of weather and on all kinds of ground. Consequently, on the proposition of the Cavalry Committee, the French Minister for War decided in April last that the winter shoeing of cavalry horses should consist of four pegs of the regulation model for each shoe, screwed into it at the toe and heels, two at the former and one in each of the latter. Under ordinary circumstances in garrisons, however, two only are to be employed, one in each heel.

ATTACHMENT OF HORSES TO LOCALITIES.—The fondness of animals, particularly horses, for their old haunts was (says the *Melbourne Weekly Times*) illustrated the other day at Wool Wool. A horse, with several others belonging to Mr. Stuart Murray, was grazing in one of the paddocks fronting Lake Corangamite, and desiring to get back to the place where he was bred and reared, the fences and stone walls being too big for him to jump, he decided to swim across. The horse first struck out for Herring Point, a distance of about three miles from the homestead, and after resting a little while there he made straight for the opposite shore, landing at the springs in the Stoney Rises, the distance from point to point being eight miles. Those who saw the horse in the water feared that he would be drowned, but he arrived at his old quarters, Colantet, apparently none the worse for his swim.

FOOT-AND-MOUTH DISEASE IN GERMANY.—At the instigation of the Minister of Agriculture, the Royal Technical Deputation of Veterinarians have fixed a prize of 3,000 marks or £150 for the discovery of a lymph by means of which foot-and-mouth disease is rendered contagious with a view to the discovery of new methods of detecting the disease. The discoverer to prove

the working of same by experiments, also to make demonstrations in presence of a committee chosen by the deputation. Papers to be handed in to the Royal Technical Deputation not later than June 30th, 1894, results will be published January 1st, 1895. Foot-and-mouth disease prevailed in about eighty districts and one hundred and thirty communities in Prussia at the end of July. The government districts of Stralsund, Lüneberg, Stade, Osnaburg, Aurich, Munster, Wiesbaden, Sigmaringen, and the town of Berlin were free from the disease at the end of that month.

THE PIG'S CHARACTER.—The pig is hated by the Hindoo, and elsewhere "as dirty as a pig" is one way of expressing gross uncleanliness. The wild boar, however, as a writer in *Baily's Magazine* points out, is a cleanly animal, and so, perhaps, our domestic pig would be if he only had a choice in his mode of living, but he has not. Any sort of accommodation is often thought good enough for a pig, and whereas stables and kennels cannot undergo too much turning out, the sty is often left to take care of itself. The pig, both wild and tame, is omnivorous, and the wild boar is not above a meal off a defunct Hindoo. The tusks of the boar are simply the canine teeth, and the length of a good pair extracted from the jaw is about ten inches outside curve, and of this length five inches are embedded in the jaw, the remaining five sticking out as a weapon of defence. The boar is beloved by the pig-sticker, and has for ages been associated with hunting, for ancient history tells us how the youthful Adonis, Venus's "young man," fell a victim to its tusks. Sir Samuel Baker says that there is an immense amount of character in a pig. "Not only is it a fierce antagonist, but it is a clever and thoughtful creature. It is all very well to quote the word 'pig-headedness,' but there is a meaning in the name which commands respect. A pig knows its own mind; when it has made up its mind it acts without any trace of hesitation; and in this it sets a bright example to many of our generals and so-called statesmen. If a pig determines to go forward nothing will stop it; but if it makes up its mind to break back through a line of beaters, even should there be a serried rank of a hundred elephants, I should like to see anything on earth that would stop a pig."—*Live Stock Journal.*

DESTRUCTION BY WILD ANIMALS IN INDIA.—A resolution by the Chief Commissioner of the Central Provinces in India on various reports relating to the damage caused by wild animals and the extermination of the latter contains some observations of more than usual interest. Amongst the animals killed for which rewards were paid were 274 tigers, 442 panthers, 131 bears, and 85 wolves. In the past four years over 1,000 tigers, 2,000 panthers, 500 bears, and 300 wolves have been destroyed. Last year 317 persons were killed by wild beasts in the provinces, while the number of deaths from snake-bite was 999. The destruction of cattle is astounding, showing an increase of about 1,200 over the previous year. Sir Anthony Macdonnell accounts for this by saying that during his recent tours he noticed a great scarcity of deer in the jungle tracts. They are being cleared out by the native huntsman, and the decrease in the natural prey of the tigers and panthers is marked by an increased loss of cattle. On the subject of rewards for the destruction of wild animals the experience of the Central Provinces seems to show that the system of offering special rewards for the destruction of particular animals or classes of animals is a sound and effective one. The resolution mentions instances of this. In July last it was decided to increase the reward from 10 rupees to 50 when it was proved the animal was a man-eater; again, a special reward of fifty rupees was offered for the destruction of a bear which had been doing much damage in the Balaghat jungles, while 300 rupees was offered for a man-eating tiger in the Chanda forests. It is said that special rewards offered in March last year for the destruction of wolves in the Saugor district had the result of reducing the number of deaths

attributed to wolves in that district from eleven to one. The Chief Commissioner also notices the localization in a few districts of most of the deaths caused by tigers and wolves. For instance, out of 98 deaths caused by tigers in the Central Provinces in 1892, 68 occurred in the adjacent districts of Chanda, Hoshangabad, and Raipur.

Correspondence.

VETERINARY SURGERY *VERSUS* CRUELTY TO ANIMALS.

SIR,—Noticing a gentleman answering my note on the above subject, in the VETERINARY JOURNAL for July, I have in answer, with all due deference to him as a clever and successful operator on animals—a position which he has placed himself in unqualified—I presume from his article—still what guarantee will he give that his successors or others may not follow in his footsteps, and take the living away from a man who has spent his time, talents, and money in in the study of veterinary science, in which science the operations on animals are carefully studied under veterinary surgery, and all qualified men are supposed to be able to practise them scientifically, and get their means of livelihood by them? In all other professions, and even trades, an unqualified man or workman who has not finished his apprenticeship is not allowed to work as a journeyman, and the societies protect trades. Why should this not be the case in the veterinary profession, and veterinary surgeons have the protection of the Royal College of Veterinary Surgeons, which is a very fair, just, and honest view of this matter?

J. D. POTTIE, M.R.C.V.S.

[It should be remembered that castration is a branch of veterinary surgery, and that no person, unless on the Register of the Royal College of Veterinary Surgeons, can designate himself a castrator without infringing the law. Such is the state of affairs, and it should afford a guarantee to the public that this operation is skilfully and humanely performed.—ED. V. J.]

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from Veterinary-Captain J. A. Nunn, A.V.D., Lahore; Dr. Hoskins, Philadelphia, U.S.A.; Professor Lylord, Minneapolis, U.S.A.; J. D. Pottie, Greenock; C. Park, Lymington; A. W. Hill, London; G. Thatcher, London; F. C. Mahon, London; O. C. Bradley, Edinburgh.

BOOKS AND PAMPHLETS: *J. Pertus*, Le Chien, Races, Hygiène et Maladies; The Statistical Year-Book of Canada; *Drs. Fleming, Bassi, and Boschetti*, Trattato di Ostetrica Veterinaria; Report from the Select Committee on Marking of Foreign Meat, etc.; Report on the Lahore Veterinary College for 1892-93; Encyklopädie der Gesummten Thierheilkunde und Thierzucht; Annual Report on the Operations of the Civil Veterinary Department; *P. Adam*, Die Lehre von der Beurtheilung des Pferdes in Bezug auf Körperbau und Leistung.

JOURNALS, ETC.: *Modern Medicine and Bacteriological World; Journal de Méd. Vétérinaire et de Zootechny; Repertorium der Tierheilkunde; Clinica Veterinaria; Cape of Good Hope Agricultural Journal; Thierarzt; Revue Veterinaire; Live Stock Journal; Echo Vétérinaire; Lancet; British Medical Journal; Baily's Magazine; Recueil de Méd. Vétérinaire; North British Agriculturist; Edinburgh Medical Journal; American Veterinary Review; Oesterreichische Zeitschrift für Wissenschaftliche Veterinarkunde; Deutsche Zeitschrift fur Thiermedecin und Vergleichende Pathologie; Mark Lane Express; Annales de Méd. Vétérinaire; Ceylon Sporting Gazette*

NEWSPAPERS: *West Cumberland Times; Baltimore Sun; Glasgow Herald; Cheshire City News.*